AI and Machine Learning in Language Education

AI AND MACHINE
LEARNING IN
LANGUAGE
EDUCATION
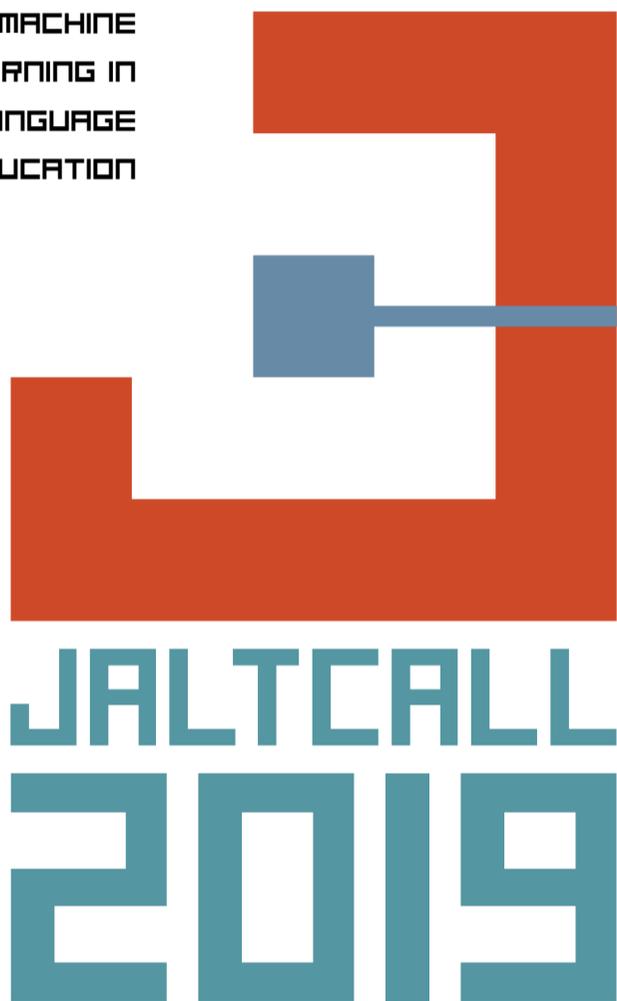
JALTCALL
2019

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Anthony Brian Gallagher, Douglas Jarrell, George MacLean
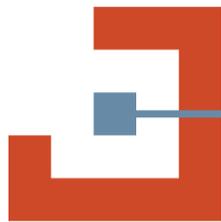
JALT CALL is a Special Interest Group (SIG) of the Japan Association for Language Teaching (JALT) that focuses on Computer-Assisted Language Learning (CALL) and technology in language learning.

http://jaltcall.org/

JALT is dedicated to the improvement of language teaching and learning.

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Layout by Paul Mason

Preface

Technology and language teaching & learning have been the subject of much discussion and research in the past forty years as the advent of computers brought new technology to a wide range of language learners. The development of CALL programs has steadily improved with the exponential increase in power and speed of computing to the point where currently multimedia applications, speech recognition, and the integration of artificial intelligence with machine learning has certainly made a remarkable impact on language education. To this end, JALTCALL2019 highlighted the cutting edge of language learning technology through a wide variety of presentations and workshops about current research into the theory and practice of AI and machine learning in language education. This volume of collected papers provides a good sample of the research and practice pertaining to the conference theme. Fourteen papers were chosen to be included in this work and they feature wide-ranging topics such as digital storytelling, video-based self-reflection, factors affecting Quizlet, content language integrated learning, WordPress in teacher education, smartphone addiction, online courses, Facebook groups, learner abstracts and corpus linguistics, useful materials for listening practice, Instagram and education, a microblog corpus using Tumblr, speaking with your computer, and syllabic typing for language learning.

The papers contained herein have been double-blind peer reviewed and chosen for publication according to their quality, suitability and academic relevance to CALL research. The editors worked with the authors to improve their manuscripts for publication in this volume of collected papers. The Editors-in-Chief hope that the readers of this volume will find these papers insightful, useful, and practical for language teachers in Japan and around the world.

We would like to thank the authors who worked diligently to provide well-researched studies and practically-focused papers with the common theme of CALL. Additionally, this book would not be possible without the dedication of our volunteer associate editing staff. We are greatly appreciative of their efforts in working with the authors to hone their manuscripts.

Editors-in-Chief
Robert Chartrand, PhD, Kurume University
Edo Forsythe, EdD, Hirosaki Gakuin University

From the SIG Coordinator and JALTCALL2019 Co-Chair

First of all, thank you for making JALTCALL2019 at Aoyama Gakuin University in Tokyo a successful event. We had almost 200 participants from 16 countries and regions as well as from all over Japan. This book is a collection of papers presented and other submissions from JALTCALL2019. We hope you enjoyed your time at JALTCALL2019 and hope to see you at JALTCALL2020 in Hirosaki City, Aomori on June 5–7, 2020.

Ryan Barnes, Nagoya Gakuin University

Editorial Team

Editors-in-Chief

Robert Chartrand is a professor at the Institute of Foreign Language Education, Kurume University. He is interested in corpus linguistics, CALL and artificial intelligence research.

Edo Forsythe is a professor and head of the Department of English Language and Literature at Hirosaki Gakuin University. His research interests include MALL and the use of smartphones in language learning.

Associate Editors

Anthony Brian Gallagher is a lecturer in the Faculty of Foreign Studies at Meijo University. His research specialty is: the user experience in quality assurance; assistive, disruptive, & cosmetic technology; and virtual learning environments.

Douglas Jarrell is a retired professor, formerly at Nagoya Women's University, whose research interests include the affordances of technology for self-study and student engagement in the classroom.

George MacLean is a professor at the University of the Ryukyus who previously taught in the Japanese and International School systems. His research areas include feedback, Mobile-learning and CALL. He is active in JALT at a local and national level and serves on review boards for several conferences and journals.

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Video-based Self-reflection of English Language Presentations

Chad Cottam, Kwansei Gakuin University
Troy Rubesch, Kwansei Gakuin University

Abstract

The mastery of oral presentation skills in English is often essential in the professional life of scientists and those studying to be scientists. This paper presents the results of a study that attempts to gauge the value of incorporating video-mediated feedback as it relates to measures of students' self-efficacy. The researchers examined the self-rating of pair presentations of 220 undergraduate university science and technology students in academic English communication courses at a private university in Japan. They compared the rubric-based self-rating scores of students from both non-assisted episodic and video-assisted recall in separate instances. The research question addressed whether a video-based reflection would serve as a more critical form of reflection than episodic memory alone. However, students generally rated themselves higher after watching a video of their performance, compared to their memory alone, raising further questions as to what measure and scope of self-assessment is most effective for Japanese students to improve their oral presentation performance.

英語での口頭発表スキルの熟達は、科学者や科学者を目指して勉強している人の職業人生にとって、多くの場合必須なことである。この論文では、ビデオを介したフィードバックの取り組みについての価値を評価しようとする研究結果を提示する。なぜなら、それは学生の自己効力感の尺度に関連するからである。研究者たちは、日本の私立大学でアカデミックイングリッシュコミュニケーションコースに在籍する、科学と技術を専門とする学部生220人のペアプレゼンテーションの自己評価を調べた。彼らは、個々の事例に於いて、ビデオを介さない一時的な記憶の場合とビデオを介した想起の両方から、学生のルーブリックに基づいた自己評価スコアを比較した。研究課題は、ビデオを介した場合の反映が、一時的な記憶だけの場合よりもより重要な反映の形として機能するかどうかということだった。 ただし、学生たちは一般に、自分の記憶だけの場合と比較すると自分のパフォーマンスのビデオを見た後では、自分自身を高く評価し、日本人学生が口頭プレゼンテーションのパフォーマンスを向上させるために、最も効果的な自己評価の尺度と範囲は何かという更なる課題を提起させている。

Keywords: **Video, self-efficacy, self-assessment, presentations**

The mastery of oral presentation skills is often important in professional life (Campbell et al., 2001) and is a key competency for lifelong learning in general and higher education in particular (Boud & Falchikov, 2006). For scientists and those studying to be scientists in particular, presentation of scientific research has been called "an indispensable cornerstone of a successful scientific career" (Zanders & MacLeod, 2010). As the English language currently dominates the global scientific community, the majority of scientists will be expected and required to use it for such high-stakes presentations (Hamel, 2007). In the case of researchers from non-native English backgrounds, the already anxiety-inducing situation of presenting scientific findings in public may be further exacerbated by language issues (Osboe et al., 2007).

This situation presents inherent challenges for L2 instructors of university students in science majors. In particular, instructors must adopt an effective and efficient instructional model for developing L2 presentation skills while still allowing adequate time and resources for acquisition of other L2 skills.

Therefore, it is essential for the skills taught to be balanced among linguistic, non-linguistic and presentation specific skills.

However, there has been little in the literature that synthesizes theory with practical pedagogy to help guide the process of teaching presentation skills in an L2 environment. One of the few notable studies from De Grez et al. (2009) addresses the social cognitive perspective and self-regulated learning principles using multimedia instruction and multiple modes of feedback. They conclude their discussion by remarking that "further investigation should centre on alternative elaborations of the training and timing of self and peer assessment. Both forms of assessment are expected to lead to a greater degree of self-regulated learning" (Nicol & Milligan, 2006). This paper presents the results of a study which attempts to gauge the value of incorporating video-mediated self-reflection in a presentation course and integrated into a socio-cognitive framework for learning, such as those of Bandura (1997), Crookes and Schmidt (1991), Schunk (2001), and Zimmerman (2000); specifically, one that promotes the sequential concepts of forethought, task performance, and post-task reflection (Schunk, 2001; Zimmerman, 2000).

Self-efficacy

Delivering a public presentation in a foreign language is a demanding and often stressful task. The link between language learners' anxiety and their perception of communicative competence has been long established (e.g., MacIntyre et al., 1997). In short, anxious language learners perceive themselves as poor communicators. By extension, anxious foreign-language presenters perceive themselves as poor presenters.

In his ground-breaking work on self-regulated learning, Bandura (1994) defined self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p. 71). In other words, self-efficacy is the belief that one has the ability to complete a given task related to a given competency. It is important to note that self-efficacy is not a measure of a person's global self-confidence. It measures one's confidence in relation to specific tasks (Bandura, 1986). Presenting in public using a foreign language is one such task.

Lack of self-efficacy manifests a number of undesirable effects on performance. When engaging in tasks in which they have low self-efficacy, people behave erratically and unpredictably. In addition to decreasing task performance, low self-efficacy has also been shown to foster the belief that tasks are more demanding than they actually are. This belief may also lead to anxiety, stress, and even depression (Pajares, 1997).

Bandura (1994) asserts that self-efficacy can both determine and predict the level of accomplishment attained by individuals. So, as L2 educators charged with increasing students' communicative competence and task achievement ability, it seems reasonable to strive to increase students' self-efficacy related to the task of public presentations.

Self-efficacy and Japanese Students

This lack of self-efficacy with regard to foreign language-based tasks may be more pronounced in Japanese students. Several previous studies have pointed out that a self-effacing tendency (reflecting low self-efficacy) is often observed among East Asian people in general and Japanese specifically (e.g., Heine et al., 1999; Heine & Hamamura, 2007; Rian et al., 2015; Suzuki & Yamagishi, 2004; Yamagishi et al., 2010). This tendency is so prevalent that it seems to represent a common cultural trait among Japanese students (Cutrone, 2009; Yamagishi et al., 2010). Considering this context, it seems that Japanese students may, as a group, have higher needs for self-efficacy enhancement in foreign communication and compared to other L2 speakers of English.

Self-assessment and Confidence

Bandura (1994) goes on to state that individual self-efficacy can be enhanced in several ways and that "the most effective way of creating a strong sense of efficacy is through mastery experiences" (p. 71). One way to provide these "mastery experiences" which augment students' self-efficacy is to have them practice presentations and evaluate their abilities regularly. This practice/self-assessment cycle can be an effective tool for increasing both ability and confidence in achievement. This cycle, which represents the essence of self-regulated learning, enables students to effectively prepare for a final presentation and assessment.

Bandura (1994) describes self-regulation as "the exercise of influence over one's own motivation, thought processes, emotional states and patterns of behavior" (p. 71). Self-assessment, a form of self-regulated learning, is a common and well-validated method for increasing learning and confidence in the L2 classroom De Grez et al. (2009). De Saint Leger (2009) describes self-assessment as "a tool well-suited to helping learners to develop appropriate goals and self-regulate or monitor their efforts accordingly." Falchikov (2005) advocates student involvement in the assessment of presentations as a means to develop self-regulating skills and foster a better understanding of assessment criteria (p. 16).

Asynchronous Video in the Classroom

Technological affordances have fostered novel approaches to conducting self-assessment. In particular, the use of mobile video has provided a valuable learning tool for language learners worldwide. As a technologically advanced country, Japan has an extremely high adoption of smartphones which can be readily used as video recorders. It is reasonable to expect that university students would have access to such devices to record video in the classroom (Toland & Mills, 2018). This creates a situation where students can have access to an audio-video recording of their in-class practice presentations virtually immediately after the completion of a presentation.

The benefits of using video recordings for self-assessment of language learning are numerous. Richards and Farrell (2005) and Jordan (2012) point out that video can provide English language learners with accurate and reliable record of their presentation performance and reduce false memories. Dufon (2002) argued that a video can reliably document "gestures, facial expressions, and other visual interactional cues [which] also provide important information both on the negotiation of meaning and the negotiation of affect" (p. 44).

Mobile-video recordings have been shown to increase motivation and confidence in some Japanese students of English (Gromik, 2012). Other studies which adopted videotaped feedback for self-assessments also reported the attainment of improved oral presentation skills (Bourhis & Allen, 1998). Furthermore, Miles (2014) asserts that Japanese students who watched videos of their public speaking performances could develop a greater sense of autonomy via the self-reflective process.

Research Question

The researchers were interested in ascertaining whether watching a video of their performance during an oral presentation would raise or lower students' self-efficacy as measured by self-assessment via a familiar rubric. Although the self-efficacy of the subject population (mainly male Japanese university students) may be generally lower, the cycle of presenting, reflecting, assessing, then watching, reflecting and re-assessing with video using a standard rating scale, may affect the cultural bias of students that tends to accompany low self-efficacy.

Method

The study involved the self-rating of individual performance in pair presentations of 220 undergraduate university science and technology students in intact, required academic English communication courses in 11 separate classes, organized by majors. The majors included Bioscience, Biomedical Chemistry, Physics, Informatics, Nanotechnology, Mathematics and Applied Chemistry. The participants' ages ranged between 18 and 21 years old, with TOEIC scores ranging between 350 and 750. Class sizes were between 19 and 26 students per class.

The course goals for each academic year included the advancement of academic presentation skills, as well as general and academic listening skills, and general discussion and conversation skills. The presentation skills emphasized were chosen to maximize student performance for science-based presentations (i.e., preparing graduates for presenting their research at scientific conferences in English). These presentation skills included physical aspects such as eye contact, posture, and gestures; as well as more language-based aspects such as voice control, enunciation, and effective use of transitions.

Following the curriculum guidelines of the course, throughout the semester students were required to research, write, practice, and deliver two "practice presentations" on a science-based topic, in pairs while in front of small groups.

As a final assessment of their presentation skills, students were required to give a 5-minute pair presentation on a science-based topic. All participants delivered the presentation twice. The first attempt was classed as a "practice presentation" and delivered in front of small groups of 6−9 students, depending on specific class size. At this time, all participants' full practice presentations were video-recorded by peers using the presenters' mobile video devices (smartphones). Immediately after their presentations, all participants were asked to initially reflect on and assess their own performance using the familiar standardized rubric (used for all presentations throughout the semester) by rating each component of their performance, on a 1−5 Likert scale (see Appendix A). The rubric involved both verbal and non-verbal aspects of their presentation performance.

After all students delivered their presentations, they then watched the video recordings of their presentations in their entirety using their smartphones and headphones. Again, they were asked to reflect upon and self-assess their performance using the same rubric as before. Results of these two rubrics and their individual assessment items were then analyzed across all 9 classes by using a combination of pair T-Tests and a repeated measure ANOVA in JASP, an open source software program supported by the University of Amsterdam (JASP Team, 2019).

Results

To test the hypothesis that Survey II mean results for body language, eye contact, and competent use of English respectively (M = 2.00, 2.04, and 1.6) were lower than the results for Survey I, pair-sampled T-Tests were performed (see Figure 1). For all three factors tested, significance was not reached, therefore the null hypothesis was not rejected (P = 0.128). However, as seen in Figure 1, there is a clear trend that suggests an increased rating in all non-lingual factors between Survey I and II.

Figure 1
  Presentation Factors, Survey I & Survey II

Descriptives Plot
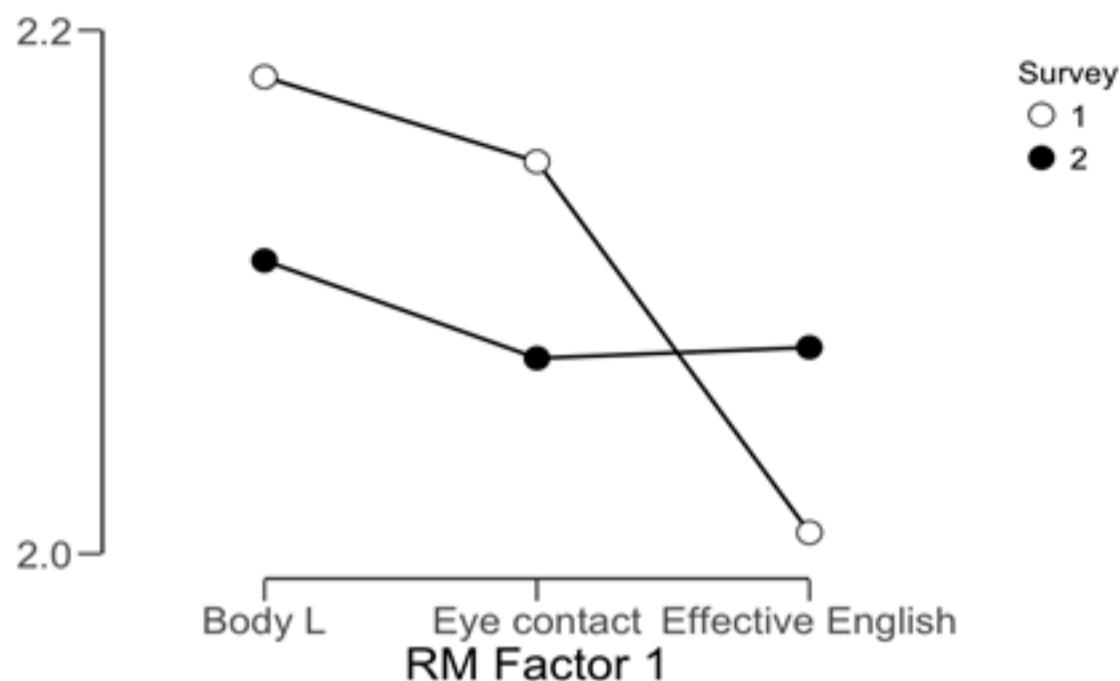
Significance between factors and each class was determined by a repeated measure ANOVA, with a significance of <0.01 (see Table 1).

Table 1
  Within-Subject Effects

	Sum of Squares	df	Mean Square	F	p	η^2
Factors	2.714	2	1.357	3.431	0.033	0.007
Factors * Survey	1.630	2	0.815	2.062	0.128	0.004
Factors * Class	29.425	20	1.471	3.721	< .001	0.072
Factors * Survey * Class	6.759	20	0.338	0.855	0.646	0.017
Residual	368.505	932	0.395			

The data showed that students' self-assessments of linguistic ability, on average, increased after watching a video of their presentations. Paradoxically, students rated themselves lower after their second chance to self-assess their non-linguistic features, alluding to the possibility that the combination of episodic and non-episodic reflection may inhibit some form of linguistic bias, yet negatively affect other aspects of self-image.

The results show a trend in certain areas of self-evaluation, particularly in linguistic components of self-assessment that are synonymous with the inhibition of self-enhancement. The students' linguistic ratings increased after video reflection, possibly indicating either a false sense of confidence somewhat akin to the Dunning-Kruger Effect, in which people with limited knowledge or competence tend to hold more confidence in their skills than that of competent people, or that students' linguistic self-enhancement has simply increased as a result of being able to use self-reflection as an objective analysis tool (Dunning, 2011). While it is important to understand the basis for these ratings, it can be strongly argued that any improvement in self-enhancement, particularly for Japanese college students, should be welcomed as a promising outcome of a reflective process.

As for non-linguistic elements, students have clearly shown a decrease in their self-efficacy following

their second reflection. This result, in opposition to the linguistic reflection, indicates an initial confidence in the use of body language that is then altered by the visual cues available. This kind of reaction to visual cues was to be expected, and considering the simplicity of this reflection task, it gave students a fair and accurate picture of their performance, compared with episodic memory reflection.

It must be noted that this study did not set out to determine whether memory-based self-reflection or video-enhanced reflection produced higher scores (indicating better performances) as the presentations studied were essentially practice presentations of the students, which by definition were not assessed by anyone but the presenters themselves. A follow-up study to determine whether and to what extent self-reflection actually increased students' practical presentation competence would be a worthy endeavor.

Although not the purpose of the study, the researchers noticed that this task, which involved self-assessment based on the grading rubric, required the student participants to become quite familiar with understanding and applying the rubric to their presentation performance. In essence, due to the nature of the study, the students spent more time engaging with the rubric and considering the quality of their presentations concretely (i.e., giving themselves specific numerical scores). This increased time on task may have been a major factor affecting a noticed improvement in the quality of the final presentations (and corresponding teachers' presentation scores), compared to previous iterations of the course.

By demonstrating a clear difference in self-rating ability between linguistic and non-linguistic presentation features, students brought the issue of student competence in self-reflection into question. While students as a whole may understand a non-verbal queue intuitively, their sensitivity to linguistic features can be broad and inconsistent. Teachers and researchers designing self-assessment in the future may need to focus clearly on the perceived versus actual knowledge of their students' own language competence. Inability to recognize students' own abilities in this area would substantially reduce the value of undertaking any such task.

Overall, this study highlights the effectiveness of technology in the self-reflection process, particularly in the culturally unique environment of the Japanese university classroom. By challenging students to reflect in an autonomous and private process, self-perceptions were clearly altered, and by requiring students to understand the individual items they were being assessed on, they were undoubtedly better prepared for their final presentations.

Conclusion

The nature of an academic presentation is to put oneself and one's ideas on the line in front of peers for judgement. For EFL students, an additional challenge comes from the constant judgement of their language competence by their instructors and peers. The current study sought to establish if and how self-assessment, through the medium of mobile video recording technology, would affect the practice and production aspects of students' performance. It was established that a self-assessment approach to teaching and practicing presentation skills may positively influence Japanese students' competence, by reinforcing critical skills, and generally promoting self-efficacy in oral performance. Having students use mobile technology in ways that increase both not only their measurable language abilities, but also their self-efficacy with regard to the numerous tasks they face in the classroom and beyond, could be a positive force in the future of EFL teaching.

References

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Prentice Hall.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). Academic Press. (Reprinted in H. Friedman [Ed.], Encyclopedia of mental health. Academic Press, 1998).

Bandura, A. (1997). *Self-efficacy: the exercise of control.* W.H. Freeman.

Boud, D., & Falchikov, N. (2006). Aligning assessment with long-term learning. *Assessment and Evaluation in Higher Education, 31,* 4, 399–413.

Bourhis, J., & Allen, M. (1998). The role of videotaped feedback in the instruction of public speaking: A quantitative synthesis of published empirical research. *Communication Research Reports, 15(3),* 256–61.

Campbell, K., Mothersbaugh, D., & Brammer, C., & Taylor, T. (2001). Peer versus self-assessment of oral business presentation performance. *Business Communication Quarterly – Bus Comm Q, 64,* 23–40. **https://doi.org/10.1177/108056990106400303**

Crookes, G., & Schmidt, R. W. (1991). Motivation: Reopening the research agenda. *Language Learning, 41,* 469–512.

Cutrone, P. (2009). Overcoming Japanese EFL learners' fear of speaking. University of Reading: *Language Studies Working Papers, 1,* 55–63.

De Grez, L., Valcke, M., & Roozen, I. (2009). The impact of an innovative instructional intervention on the acquisition of oral presentation skills in higher education. *Computers & Education, 53,* 112–120. **https://doi.org/10.1016/j.compedu.2009.01.005**

De Saint Leger, D. (2009). Self-assessment of speaking skills and participation in a foreign language class. *Foreign Language Annals, 42,* 158–178. **https://doi.org/10.1111/j.1944-9720.2009.01013.x**

Dufon, M. A. (2002). Video recording in ethnographic SLA research: Some issues of validity in data collection. *Language Learning & Technology, 6(1),* 40–59.

Dunning, D. (2011). The Dunning-Kruger effect: On being ignorant of one's own ignorance. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology. Advances in experimental social psychology,* Vol. 44, (pp. 247–296). Academic Press.

Falchikov, N. (2005). *Improving assessment through student involvement: Practical solutions for aiding learning in higher and further education.* Routledge Falmer.

Gromik, N. A. (2012). Cell phone video recording feature as a language learning tool: A case study. *Computers & Education, 58(1),* 223–230. **https://doi.org/10.1016/j.compedu.2011.06.013**

Hamel, R. (2007). The dominance of English in the international scientific periodical literature and the future of language use in science. *AILA Review, 20,* 53–71. **https://doi.org/10.1075/aila.20.06ham**

Heine, S. J., & Hamamura, T. (2007). In search of East Asian self-enhancement. *Personality and Social Psychology Review, 11(1),* 4–27. **https://doi.org/10.1177/1088868306294587**

Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review, 106,* 766–794.

Jordan, L. (2012). Video for peer feedback and reflection: embedding mainstream engagement into learning and teaching practice. In *Research in Learning Technology Supplement: alt-c 2012 Conference Proceedings,* 16–25.

MacIntyre, P., Noels, K., & Clément, R. (1997). Biases in self-ratings of second language proficiency: The role of language anxiety. *Language Learning, 47(2),* 265–287.

Miles, R. (2014). The learner's perspective on assessing and evaluating their oral presentations. *Proceedings of classic 2014: The sixth international conference,* 337–352. **https://www.fas.nus.edu.sg/cls/CLaSIC/clasic2014/Proceedings/miles_richard.pdf**

Nicol, D. J., & Milligan, C. (2006). Rethinking technology-supported assessment in terms of the seven principles of good feedback practice. In C. Bryan & K. Clegg (Eds.), *Innovative Assessment in Higher Education,* Taylor and Francis Group Ltd.

Osboe, S., Fujimura, T., & Hirschel, R. (2007). Students' confidence and anxiety in L2 speaking activities. In *Independent Learning Association 2007 Japan Conference: Exploring theory, enhancing practice: Autonomy across the disciplines.* Kanda University of International Studies, Chiba, Japan.

Pajares, F. (1997). Current directions in self-efficacy research. In M. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement* Vol. 10, (pp. 1–49). JAI Press.

Rian, J. P., Hinkelman, D., & Cotter, M. (2015). Self-, peer, and teacher assessments of student presentation videos. In P. Clements, A. Krause, & H. Brown (Eds.), *JALT2014 Conference Proceedings.* JALT.

Richards, J. C., & Farrell, T. S. C. (2005). *Professional development for language teachers: Strategies for teacher learning.* Cambridge University Press.

Schunk, D.H. (2001). Social Cognitive Theory and Self-Regulated Learning. In B.J. Zimmerman & D.H. Schunk (Eds.), *Self-Regulated Learning and Academic Achievement: Theoretical Perspectivist Theories-An Educational Perspective* (pp. 125–151). Prentice Hall. Lawrence Erlbaum Associates.

Suzuki, N., & Yamagishi, T. (2004). An experimental study of self-effacement and self-enhancement among the Japanese. *Japanese Journal of Social Psychology, 20,* 17–25.

Toland, S. & Mills, D. J. (2018). Present, record, reflect. In G. Kessler (Ed.), *Voices from the TESOL classroom: Participant inquiries in online and hybrid classes.* TESOL Press.

Yamagishi, T., Hashimoto, H., Cook, K. S., & Toko, K. (2010). Modesty in self-presentation: A comparison between the US and Japan. *Center for Experimental Research in Social Sciences, Working Papers, 116,* 1–13. **https://lynx.let.hokudai.ac.jp/CSM/english/workingpaper/abstract/No116.pdf**

Zanders, E., & MacLeod, L. (2010). *Presentation skills for scientists.* Cambridge University Press.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-regulation* (pp. 13–39). Academic Press. **https://doi.org/10.1016/B978-012109890-2/50031-7**

Appendix A

Survey on your presentation 1/2

1. My body language was:
   Very Good! – 5   4   3   2   1 – Terrible

2. My eye contact was
   Very Good! – 5   4   3   2   1 – Terrible

3. My English is easy to understand
   Yes – 5   4   3   2   1 – No

Author's Information:

Chad Cottam holds a BA in Applied Linguistics from Griffith University and a Master's degree in Applied Linguistics (TESOL) from the University of New England, both in Australia. Chad's research focuses on reducing language anxiety, goal orientation, motivation and technology, and the creation of integrated study and assessment systems that combine new technologies with linguistic research in the fields of motivation, goal orientation, and self-reflection.

Email: **chadcottam@kwansei.ac.jp**

Troy Rubesch holds an MA Second Language Studies specializing in Language Pedagogy from the University of Hawaii, USA. His research interests center around the use of technology in language education. He has published on topics including conversational agents (chatbots) in language learning, distance education, and technology in self-access learning.

Email: **trubesch@kwansei.ac.jp**

2

Factors Affecting Quizlet Usage Among Students

Armando Duarte, University of Shiga Prefecture

Abstract

Why do some students independently use Quizlet often, while others rarely seem to log in? What are the motivational factors that may influence student use of Quizlet outside of a classroom setting? These are the questions that the current research seeks to answer. A survey of 27 English language learners regarding the frequency and length of Quizlet use, as well as their attitudes toward the application, provided some answers to the above questions. Theories of motivation for language learning defined by Dörnyei (1994) and others also provide a theoretical background for the current research. Suggestions for improving the frequency of Quizlet use outside of a classroom setting are provided at the end.

なぜ一部の生徒は自主的にQuizletを頻繁に使うのに、他の生徒はほとんどログインすらしないのですか？ クイズレットの教室以外での使用に影響を与える可能性のある動機付け要因は何ですか？ これらは、現在の研究が答えようとしている質問です。クイズレットの使用頻度と使用期間、サービスに対する態度に関する27人の英語学習者の調査では、これまでの質問に対するいくつかの回答が得られました。 Dörnyeiなどによって提起された動機づけの理論は、現在の研究の理論的背景を提供する。 クイズレットの教室外での使用頻度を増加するための提案は、最後に提示されます。

Keywords: **Quizlet, motivation, smartphone, CALL, MALL**

The use of Quizlet has been extensively studied (Dizon, 2016; Sonobe & Ogata, 2017; Humphreys, 2017; Sanosi, 2018; Wolff, 2016; Ozer & Kocoglu, 2017), and several researchers are well-known for their research on student motivation and factors which influence technology adoption (Dörnyei, 1994, Dörnyei, 1998 as cited in Alizadeh, 2016; Davis, 1989). These two fields intersect in the current research which will explore and identify factors which may influence Quizlet usage outside of a classroom setting. This paper will provide a literature review of previous Quizlet research which includes theories of motivation and technology adoption, an overview of the student population, research context and instrument, an analysis of findings, limitations, and finally a conclusion which includes suggestions on how to successfully increase Quizlet usage amongst students.

Literature Review

Many CALL researchers and practitioners have researched Quizlet and found it to be more beneficial compared to traditional study methods. Dizon (2016) conducted research involving nine foreign language university students and found that Quizlet usage resulted in significant score increases on vocabulary tests. Sanosi (2018) came to a similar conclusion in a 2018 study involving 42 students in Saudi Arabia. Sanosi's findings were that using Quizlet helped students achieve a 23% increase in test scores after using the application. Humphreys (2017) also found that Quizlet usage resulted in higher vocabulary gains for students compared to a traditional paper Word Card study method. Sonobe and Ogata (2017) conducted research on 125 university students enrolled in English conversation classes and their research echoed the findings of other researchers – using Quizlet as a study method was more beneficial for student vocabulary gains compared to traditional study methods, like

paper flashcards or vocabulary textbooks. Ozer and Kocoglu (2017) conducted research on 89 foreign language students at a vocational school in Turkey and also found that using Quizlet resulted in increased vocabulary retention compared to a traditional method like having students study through rote methods exclusively. Wolff (2016) conducted survey research on 96 university students, over 90% of whom responded that Quizlet aided in vocabulary memorization and increased their enjoyment of studying English by using their smartphone. Thus, previous research indicates that Quizlet is an effective vocabulary learning tool which produces tangible gains in the field of vocabulary acquisition. However, care should be taken not to conflate an *effective* learning tool for an *engaging* one – that is to say, while Quizlet has been shown to aid in vocabulary learning, less research has been done on whether any of the Quizlet and any of its study modes are engaging. For the purposes of this study, "engaging" is defined as "fun" or "enjoyable". The current research, then, will focus on whether or not students found Quizlet to be enjoyable, whether or not students found Quizlet easy to use, and to what extent these two variables affected students' independent Quizlet usage.

Method

Participants and Research Context

The participants of this study were 27 female non-English major students enrolled in a 15-week compulsory English class at a public university in western Japan. At the time this research was conducted (April – July 2018), the average TOEIC score was 475 and the median TOEIC score was 445.

Quizlet usage during class meetings consisted of approximately 20 minutes of free time use at the end of each class period. The class was held in a CALL classroom in which each student was sitting at a desk equipped with a built-in PC which they used for Quizlet during class. Some students were observed using Quizlet on their smartphone during this period. In the very first class session, students underwent a short orientation session in which they were introduced to the various features of Quizlet available on the desktop website and smartphone browser version and also instructed to download the Quizlet smartphone application. Out of privacy concerns, the researcher did not confirm whether or not students had downloaded the smartphone application. However, in the post-class survey, out of nine students who did not download the Quizlet application, three (33%) cited smartphone storage space as their reason for not downloading the app.

The teaching context in which this research was conducted was a content-based learning class which met once a week for 15 weeks, with each class meeting consisting of 90 minutes. The textbook used for this class contained 15 chapters and each chapter contained eight vocabulary words. The researcher created one set of Quizlet flashcards per chapter. Students were tested on their knowledge of the vocabulary in the form of four quizzes throughout the semester and a final examination, which consisted of a mix of vocabulary and short answer questions from the previous quizzes. The quizzes and final exam accounted for 70% of their class grade. Each quiz consisted of eight vocabulary matching items and four short answer and sentence unscrambling items. The final exam consisted of thirty vocabulary matching items and ten short answer and sentence unscrambling items.

Research Instrument

In July 2018, the 27 students enrolled in the course were given a survey about their experiences using Quizlet throughout the semester. The survey consisted of six 5-point Likert scale items, as well as four questions which were a mix of Likert scale and short answer items. Students were asked about whether they had downloaded the Quizlet smartphone application, how often and for how long they had used Quizlet outside of class, and about their impressions regarding Quizlet's usefulness in vocabulary acquisition and ease of use.

The survey was printed and distributed to students at the conclusion of the final examination. Out of 27 students, two students provided answers in which it was difficult to ascertain the frequency of their Quizlet usage outside of class – one student responded both that she used Quizlet 1–4 times per week *and* five times per month, while another responded that she used Quizlet "0.5 times" per month. As a result, these two student responses were omitted from the final analysis and data from 25 students was used.

Results

Based on student responses, two groups were identified – frequent and infrequent users. In this study, frequent users are those who responded as having used Quizlet more than once a week. That group consists of 11 students, while the infrequent users, who reported using Quizlet less than once a week, account for the remaining 14 students as seen in Table 1.

Table 1

Frequency of Independent Quizlet Usage Reported by Students

Usage Frequency	Frequent Users (n = 11)	Infrequent Users (n = 14)	%
Never		2	14.29
Once a month		1	7.14
Twice a month		5	35.71
Once a week		6	42.86
Once or twice a week	1		9.09
Five times a month	1		9.09
Twice a week	8		72.73
Three times a week	1		9.09

Students also reported the length of each Quizlet session outside of class as shown in Table 2. Among all students, 60% used Quizlet independently for less than 15 minutes per session or between 20 to 24 minutes per session. Among frequent users, three (27.27%) reported using Quizlet for less than 20 minutes per session, while eight (72.72%) reported sessions of 20 minutes or more. No students in the frequent user group reported using Quizlet for less than 20 minutes per session. Among infrequent users, seven (50%) reported using Quizlet for less than 20 minutes per session, while three (21.42%) reported using Quizlet for 30 minutes or more. Two students (14.28%) in the infrequent user group did not answer the survey question.

Table 2

Length of Independent Quizlet Usage Sessions Reported by Students

Usage (minutes)	All Users (n = 25)	%
No answer	2	8
<15	7	28
15 – 19	3	12
20 – 24	8	32
25 – 29	1	4
30+	4	16

The research instrument also included a question regarding whether or not students had downloaded the Quizlet smartphone application. That data, along with Quizlet usage length data, is shown

in Table 3. Student responses to this question indicate that the frequent user group had a higher proportion of students who downloaded the Quizlet smartphone application. Given that the frequent user group both used Quizlet more often than the infrequent group and used it for longer periods of time, it could be the case that increased independent Quizlet usage hinges on whether or not students have downloaded the smartphone application.

Table 3

Quizlet App Download Rates Between Frequent and Infrequent Users

	Frequent Users (n = 11)	%	Infrequent Users (n = 14)	%
Downloaded Quizlet app	8	72.73	6	57.14
Did not Download Quizlet app	3	27.27	8	42.86

Table 4 indicates that, in this study, it is the case that independent Quizlet usage is increased if students have downloaded the smartphone application. More frequent users than infrequent users downloaded the application, and frequent users reported longer usage times compared to infrequent users.

Table 4

Quizlet App Download Rates and its Effect on Usage Length

Independent Quizlet Usage (minutes)	Frequent Users (DL) (n = 8)	Frequent Users (NDL) (n = 3)	Infrequent Users (DL) (n = 8)	Infrequent Users (NDL) (n = 6)
0	0	0	0	2
<20	3	0	4	3
>20	5	3	4	1

Note. DL – Downloaded Quizlet app, NDL – Did not download Quizlet app.

If it is the case that Quizlet application download rates lead to increased Quizlet usage outside of class time, why might students not be downloading the application? Research from Davis (1989) and Dörnyei (1994) about factors which influence technology adoption, as well as theories of motivation, can help answer this question. Specifically, the researcher suggests that students who do not feel that Quizlet is easy to use or is not useful will be less likely to download the Quizlet smartphone application and thus, use Quizlet less frequently outside of class.

Ease of Use and Perceived Usefulness

Davis (1989) proposed a model of technology usage which essentially identified ease of use and perceived usefulness as the two main factors which will influence whether or not a piece of technology will be adopted by potential users. Although Davis' research took place before the proliferation of smartphone technology and CALL in language teaching, his research is often cited in the context of technology adoption and the two factors he names as having a significant impact on technology use – ease of use and perceived usefulness – can easily be transferred over to CALL and English language teaching. In the current study, frequent users reported higher average scores on survey questions regarding Quizlet's usefulness, ease of use, and engagement compared with infrequent users as shown in Table 5. However, as Table 5 indicates, a t test conducted between the two groups on their responses about Quizlet's usefulness, ease of use, and engagement produced a p value of 0.05. Because p values of less than 0.05 are indicative of a significant difference between two groups of data, it cannot be said that the survey results in Table 5 indicate a strong difference between the groups. One explanation for

this t test result could be found in the question which asks about whether or not Quizlet was useful for learning vocabulary. The mean of the two groups – 4 and 3.46 – are much closer than the mean values for every other question on that section of the survey. While all 11 frequent users gave Quizlet the highest score on usefulness, 11 infrequent users *also* gave Quizlet the highest score for usefulness which could indicate that perceived usefulness was not a great indicator of whether or not students would use Quizlet independently. Frequent and infrequent user means regarding Quizlet's engagement (fun) resulted in a difference of 0.8 – the second highest difference after the question regarding using Quizlet in the future. It could be the case that the frequent user group perceived Quizlet to have some innate engagement which the infrequent user group did not perceive, leading to increased independent use.

Table 5

Attitudes Towards Quizlet Usefulness, Ease of Use, and Engagement Between Frequent and Infrequent Users

	Frequent Users (n = 11) Mean	Infrequent Users (n = 13)* Mean	t
Quizlet was useful for learning vocabulary	4	3.46	
Quizlet could be useful in my non-English classes	2.45	1.84	
I want to use Quizlet to study more English vocabulary in the future	3.45	2.3	0.05
It was easy for me to make a Quizlet account	3.36	2.92	
It was easy for me to use Quizlet	3.72	3.07	
Using Quizlet made vocabulary study more fun	3.72	2.92	

Note. Not sure – 0, Strongly disagree – 1, Disagree – 2, Agree – 3, Strongly agree – 4.

*One student submitted an incomplete survey resulting in a smaller than usual number of infrequent users

One of the first hurdles of using technology is the orientation process, in which students must often make a username or register an email address before using certain software and Quizlet is no different. Only three students (23%) in the infrequent user group strongly agreed it was easy to make a Quizlet account compared with seven (63%) students in the frequent user group. On the subject of Quizlet's ease of use, four (30%) students in the infrequent user group strongly agreed that it was easy to use Quizlet, while eight (72%) of students in the frequent user group gave the same answer. Although the two groups' responses to the survey did not produce a statistically significant difference, as Davis' research indicated, ease of use and perceived usefulness were good predictors of independent Quizlet usage.

Motivation and Technology Use

Dörnyei (1994) defined two types of language learning motivation which may affect students – intrinsic and extrinsic, the former being a type of motivation in which one partakes of an activity for enjoyment while the latter is a type of motivation in which an activity is simply a means to an end. For example, someone who goes to the gym because they simply enjoy exercise is acting on intrinsic motivation, while someone who was told to lose weight or face serious health problems in the future by a doctor is acting on extrinsic motivation.

All students who took part in this survey were exposed to the same extrinsic motivators. That is, all students were subject to the same vocabulary quizzes and final examination, of which Quizlet was one study tool. Because they were second year students in their first semester at the time this research

took place, there were ostensibly no other extrinsic factors at play – no students were under threat of expulsion or retention if they did not receive a passing grade and so on.

To assess intrinsic motivation, the researcher asked the students to measure Quizlet's engagement, or fun, via the final survey question. Because the previous survey items deal with either Quizlet's ease of use or effectiveness in language learning, those questions could gauge intrinsic motivation. Although the data is limited, the mean difference between the groups, 0.80, could be used as an indication that the higher score given by the frequent user group played some role in that group's more frequent and longer Quizlet sessions compared to the infrequent group.

Discussion

Limitations

In the researcher's opinion, asking students to provide any sort of written answer can result in student confusion and unusable data. As a result, future replication studies should use a survey which includes only Likert scale items. Also, the students in this research did not experience Quizlet Live, a group game-like activity. Students in other departments, who were not part of this study and were exposed to one-off or occasional games of Quizlet Live, responded enthusiastically to that study mode of Quizlet and there is a strong possibility that Quizlet Live usage with the students in this study may have resulted in more applications usage and more frequent out-of-class usage. Another limitation is that the findings in this study are not applicable to a larger population due to the small sample size and future replication studies should include a larger student population. Finally, future research in this survey should poll students about several aspects of Quizlet's usefulness, ease of use, and engagement which were not present in this survey.

Conclusion

The results of this exploratory study indicate that students must feel strongly that a certain smartphone application, or any technology, will be easy to use and useful before it will be widely adopted and used independently. In the case of the current research, students who did not feel that Quizlet was easy to use, or that it was not useful for them in any English class or a class of any other discipline, were more likely to use Quizlet less frequently compared to enthusiastic students. In other words, students who felt that Quizlet was easy to use and useful were more likely to use the application independently and, in turn, more frequently.

Any CALL practitioners who wish to incorporate Quizlet or a similar application into their curriculum should make it a point to make the orientation and registration process as smooth and easy as possible. Oftentimes, it is in those first few minutes of using a new application that students make up their minds about whether or not it is easy to use, and if a new application is not easy to use, what would lead the student to think it is useful? Davis (1989) identified these two factors as the main drivers of technology adoption nearly 30 years ago and even though technology itself has advanced greatly since, the factors which influence technology adoption have not changed.

References

Alizadeh, M. (2016). The Impact of Motivation on English Language Learning. *International Journal of Research in English Education, 1*(1), 11–16.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319–340.

Dizon, G. (2016). Quizlet in the EFL Classroom: Enhancing Academic Vocabulary Acquisition of Japanese University Students. *Teaching English with Technology, 16*(2), 40–56.

Dörnyei, Z. (1998). Conceptualizing Motivation in Foreign Language Learning. *Language Learning, 40*, 46–78.

Dörnyei, Z. (1994). Motivation and Motivating in the Foreign Language Classroom. *The Modern Language Journal, 78(3)*, 273–284.

Humphreys, B. (2017). An investigation into the effectiveness of using ICT vs. word cards to study and learn English vocabulary. *Journal of Research and Pedagogy of Otemae University Institute of International Education, 3*, 45–59.

Ozer, Y. E., & Kocoglu, Z. (2017). The Use of Quizlet Flashcard Software and Its Effects on Vocabulary Learning. *TOMER, 168*(1), 61–82.

Sanosi, A. B. (2018). The Effect of Quizlet on Vocabulary Acquisition. *Asian Journal of Education and E-Learning, 6*(4), 71–77.

Sonobe, N., & Ogata, T. (2017). Methods of Target Vocabular Previewing: The Relationship between Preferences and Academic Scores. *Journal of Health and Nutrition Science in Nishikyusyu University, 3*, 9–15.

Wolff, G. (2016). Quizlet Live: The Classroom Game Now Taking the World by Storm. *The Language Teacher, 40*(6), 25–27.

Appendix A

Research Survey

1. How often did you use Quizlet outside of class time?

    every day   _____ times per week   _____ times per month   never/only in class time

2. If you used Quizlet outside of class time, about how much time did you use it each time?

30 minutes or   25 – 29 minutes   20 – 24 minutes   15 – 19 minutes   less than 15
    more   minutes

3. If you did not use Quizlet outside of class time, why not?

_____

4. Did you download the Quizlet smartphone application?
Yes   No
  →   Why:

_____

5. Quizlet was useful for learning vocabulary.
I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

6. I want to use Quizlet could be useful in my non-English classes.
I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

7. I want to use Quizlet to study more English vocabulary in the future.
I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

8. It was easy for me to make a Quizlet account.

I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

9. It was easy for me to use Quizlet.

I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

10. Using Quizlet made vocabulary study more fun.

I'm not sure   Strongly disagree   Disagree   Agree   Strongly Agree

Author's Information:

Armando Duarte has been teaching in Japan since 2011. He obtained his Master of Arts in TESOL from the University of Southern California and is currently a specially appointed associate professor at the University of Shiga Prefecture. His teaching and research interests include speaking assessment, CALL, and CLIL.

Email: **duarte.a@office.usp.ac.jp**

3

Negative and Positive Aspects of Using WordPress to Facilitate Reflective Practice in Pre-service Teacher Education

James M. Hall, Iwate University

Abstract

The author developed a web-based lesson study application (LS APP) using WordPress to facilitate the reflective practice of pre-service teachers belonging to a Japanese university. The LS APP uses WordPress's native functions to organize content and plugins to enable observers to post text, pictorial, or video observations of classes and encourage online communication. Up to now, the LS APP has been employed in both Thailand and Japan; the positive aspects have been archiving of student lessons, all observers being able to share their insights, and being a useful source of feedback for the student-teachers. The negative aspects have been the challenge of being able to type observations and observe at the same time as well as a myriad of technical issues. This article will detail how WordPress has been customized to create the LS APP as well as the benefits and issues of its implementation. It is hoped that this article will serve as a reference for both those interested in the educational uses of WordPress and ways of using technology to enhance pre-service teacher education.

研究者は日本の大学に所属する教育実習生のリフレクティブ・プラクティスを進行させるために、ワードプレス使用して、ウェブでアクセスできる授業研究アプリ(LS APP)を開発した。LS APPはワードプレス付きの機能を使って、授業研究の内容を整理し、プラグインの活用を通して、参観者による授業に関するコメント、画像、動画の投稿を可能にし、授業者・参観者のオンライン・コミュニケーションを進行させる。今まで、LS APPは日本とタイで使用されてきた。LS APPの使用に対する利点として実習生の授業の成果の保管ができること、授業の参観者が自分の見識の共有ができること、実習生にフィードバックを与えられることをあげられる。LS APPの減点として、授業を見ながらアプリにコメントを書く難しさ、他の利便性の課題、アプリのバグ・不具合をあげられる。この論文では、LS APPとして機能できるようにどのようにワードプレスがカストマイズされたかと、ワードプレスの応用に当たっての利点と課題が述べられる。この論文の内容が、ワードプレスの教育活用、又は、実習生の教員養成をより高める為にのICT活用に関心のある読者に参考になることが望まれている。

This article describes how WordPress and its plugins were customized to develop a Lesson Study Application to encourage student-teacher reflection and development in a pre-service English teacher education program. According to Rogers (2003), attributes of innovations favorable to adoption are the following: their use offers a relative advantage; they are compatible with the programs in which they are being employed; they are not too complex; it is possible to trial them; their effects can be observed. The Lesson Study Application (LS APP) has been developed on the assumption that its success will depend on it being compatible with the teacher education program goals, being able to enhance student-teacher reflection, and being sufficiently easy to use. These benefits also need to be apparent to the users. This article first gives a brief overview of the author's pedagogical purpose behind using WordPress and the context in which it is used: develop "thinking practitioners" through a process of reflective practice featuring lesson study. Second, it introduces WordPress and how the

author customized it to develop a tool to enhance students' reflective practice. Third, through the author's experience of using the LS APP and analyzing the way it has been utilized by student-teachers and in-service teachers, the positive and negative aspects of using WordPress as an LS APP are discussed.

Teachers as Thinking Practitioners

Teaching is a highly unpredictable endeavor. For example, as a conclusion of his longitudinal research on classroom learning, Nutthall (2007) argued that a good teacher is not observable because "the teaching that produces most learning in students varies from day to day, from class to class, and from time to time in the same class" (p.24). Because good teaching is not prescriptive, the field of teacher education has used reflective practice as a means of helping aspiring professionals make sense of complex situations (Moon, 2004). Reflective practice can be thought of as a continuous process of analyzing and making efforts to improve one's teaching (Pollard & Pollard, 2014); effective reflective practice should be informed by theory (Farrell, 2019), based on evidence rather than exclusively subjective observations (Mann & Walsh, 2017), and collaborative. This article defines "thinking practitioner" as a teacher who routinely engages in reflective practice to make sense of the complex situations which all teachers experience.

Lesson Study and LS APP as Tools for Developing "Thinking Practitioners" in Pre-Service Teacher Education

The author is involved in English teacher education at a Japanese national university whose goal is to encourage students to be thinking practitioners and utilized the LS APP. Data from student-teacher usage was collected during a teaching internship in Thailand run by the author's department. This section first gives a brief background of the internship program, then it discussed the lesson study process to develop thinking practitioners, and lastly how the LS APP was designed to facilitate this process.

The teaching internship program in Thailand is called the Puean (Friendship) Program. In this program student-teachers teach at high schools in Bangkok for two weeks. Each student plans and conducts a lesson whose principles are based on Content-and-Language-Integrated Learning (CLIL) and whose objectives are aligned with the Thailand National English Curriculum. Over the span of two weeks, each student-teacher continuously conducts their lessons to different classes, reflects on her/his lesson, and improves it. It is the author's belief that the process for teacher development and LS APP characteristics and functions to facilitate this process can be employed in teacher education programs in other contexts.

The object of inquiry in lesson study is the teaching and learning process in the classroom with the aim of improving teachers' professionalism and practical abilities (Usui, 2011). According to Lewis et al. (2006), lesson study is a collaborative process of 1) Studying the curriculum and formulating goals; 2) Planning the research lesson(s); 3) Conducting the lessons and collecting data; and 4) Reflecting on the lesson and data. Overall, lesson study has two primary purposes: one, to gain a deeper understanding of how to encourage student learning in the classroom; two, for teachers to collaboratively help one another develop through constructive discussion about their pedagogical decisions (Sato & Sato, 2003).

Figure 1

Process of Using the LS APP for Teacher Development
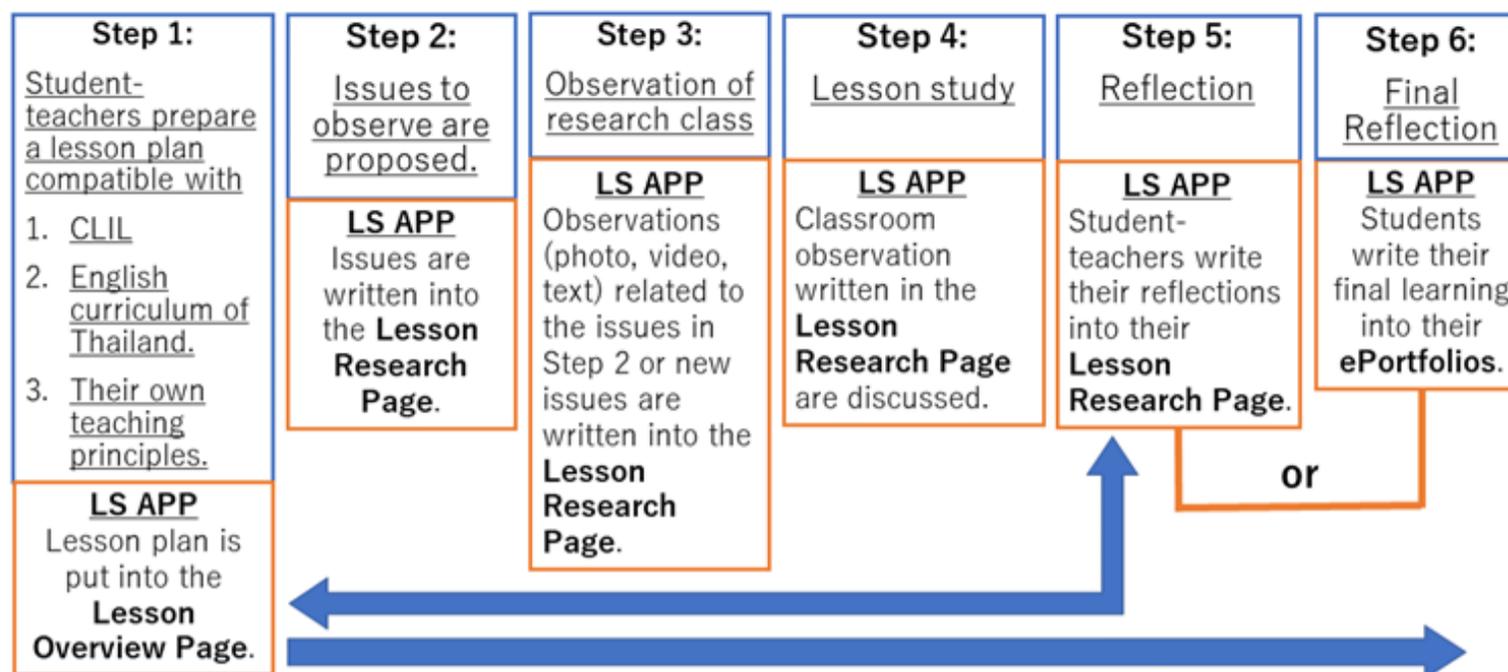
Figure 1 shows the teaching development process in the Puean Program. In Step 1, student-teachers create a lesson plan compatible with their knowledge of CLIL, the Thai foreign language curriculum, and their own teaching principles. On the LS APP, they create a Lesson Overview Page containing their plan, a description of its CLIL components, targeted standards from the Thai foreign language curriculum, and a description of their own teaching principles. In Step 2, student-teachers create a Lesson Research Page in the LS APP and post questions which they want the lesson observers to focus on during their research lesson. In Step 3, observation of the research class takes place and observers write their observations related to the teachers' questions or other issues of importance in the Lesson Research Page. Observations can be text comments, pictures, or video. In Step 4, a lesson study is conducted with participants referencing the comments in the Lesson Research Page. In Step 5, student-teachers write what they learned into their Lesson Research Page and return to Step 1, revising their lesson plan. If they have completed their final lesson, student-teachers summarize their development in their ePortfolios.

Overall, it is hoped that this process of development which utilizes the LS APP and is based on the idea of lesson study will encourage collaborative and valid reflective practice which will promote teacher development.

Customizing WordPress to Develop an LS APP as a Tool for Developing Thinking Practitioners

WordPress is a content management system (CMS): users create and organize different kinds of content such as pages, blog posts, forms, and media. WordPress enables the site administrator to create "an entire website full of sections and features that offer different experiences for [its] visitors" (Sabin-Wilson, 2017, p. 17). As of 2019, approximately 34% of all websites were created with WordPress (W3Techs, 2019). WordPress also has hundreds of associated plugins created by third parties. Plugins are add-on programs to WordPress which provide extra functionality. For the LS APP, existing features of WordPress served as a means to produce and organize content while plugins enabled users to interact, restricted content to registered users, and created an online community. The primary features of the LS APP can be categorized into content management, user interaction, and privacy.

Content Management Features of the LS APP

Table 1 shows the necessary content management features of the LS APP. This section will explain these features and use the Puean Program LS APP to show examples of them.

Table 1

Content Management Features of the LS APP

Necessary Features	WordPress Features/ Plugins	LS APP Area
1. Archived and recent content is accessible	WordPress: Posts, categories, menus Plugin: Elementor	Front Page
2. Navigable overview of previously taught lessons with lesson plan, worksheets, descriptions	WordPress: Posts, tags, embedding Plugin: Show/ hide, Expand/collapse, Posts-in-page	Lesson Overview Page
3. Users can share knowledge generated from Lesson Study	WordPress: Posts, tags, Multisite	Lesson Overview/ Research Pages, ePortfolio

Feature 1: Accessible content. The LS APP consists of archived information about previously taught lessons, information about lessons to be taught, and information about the teaching practicum. This information must be easily accessible to users. In the Puean Program LS APP, archived lessons, new lessons, and program information were written into WordPress blog posts. These posts were grouped into menus, which is a WordPress native function. Using *Elementor*, a front page editing plugin, these menus were placed into the front page of the site so that all the information could be readily accessible. Figure 2 shows a screenshot of placing a menu into the front page using *Elementor*.

Figure 2

Content Accessibility of the Front Page

Feature 2: Overview of lessons. The second necessary feature is navigable overview of previous or current lessons. The 2019 Puean Program had six different lessons: Fashion, Flower cards, Hokkaido, Japanese products, J-Pop music, and Tohoku food. Their respective Lesson Overview Pages contained relevant information observers would need to understand the pedagogical purposes of the lesson, their content, and actual outcomes. Figure 3 shows a screenshot of the upper and lower parts of the Lesson Overview Page for the Flower Card game (*Hanafuda*). The *Show/Hide* and *Expand/Collapse* plugins were used so that the page would not be cluttered with text, but users could still grasp the breadth of information by seeing the headings. The lesson plan, which could be shown or hidden, was embedded from Google Drive. Therefore, if student-teachers revised their lessons, the changes would appear on the post. At the bottom of the pages are links to all posts of "Flower Cards" Research Lessons. These

post excerpts were inserted into the Lesson Overview Page using the plugin *Posts-in-page*. Figure 3 shows that posts with the category "Flower Cards" under the parent category "2019 Research Lessons" were inserted into the page.

Figure 3

Lesson Overview Page for Flower Cards (Upper Half and Lower Half)
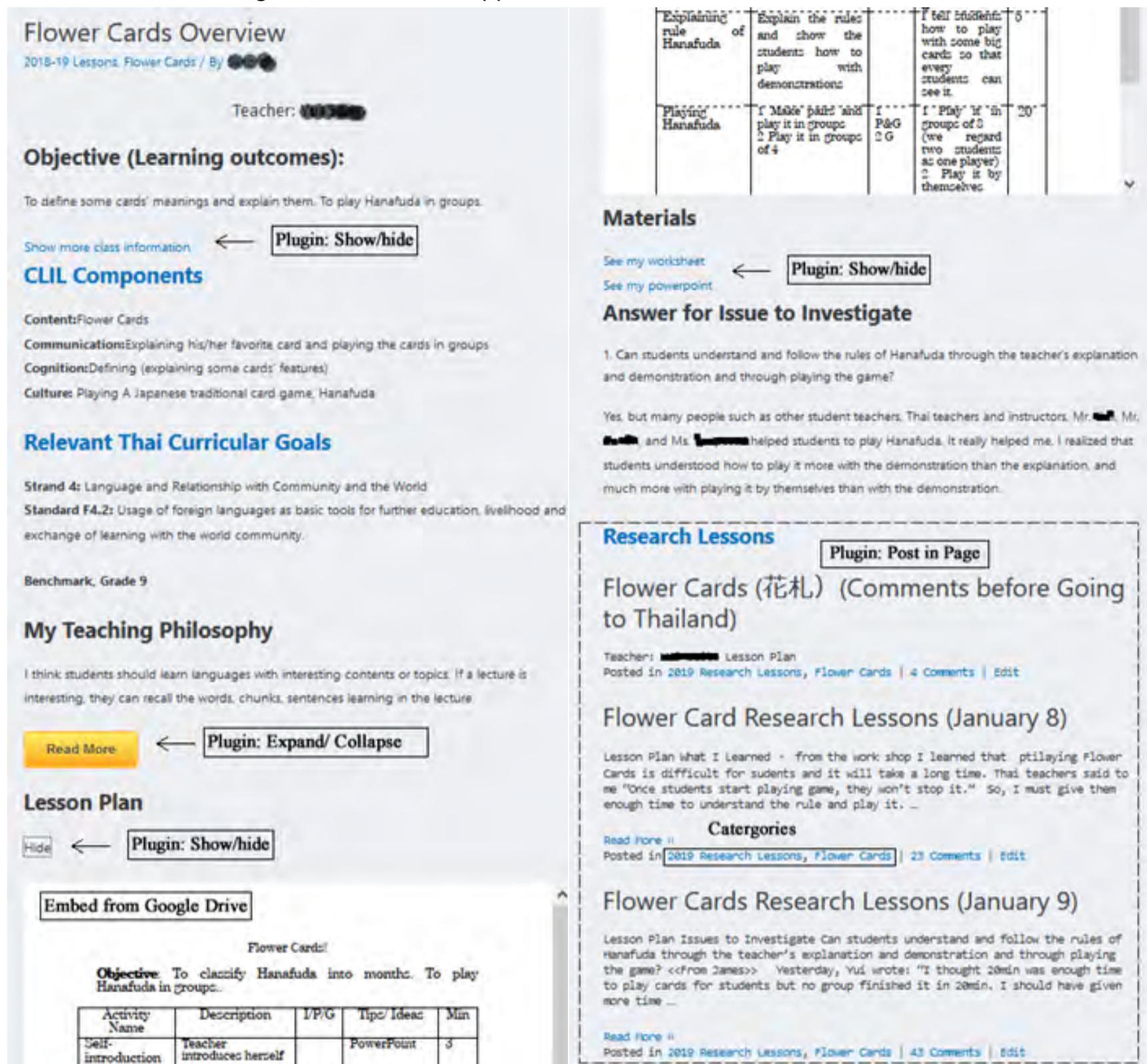
Feature 3: Sharing generated knowledge. The last feature was sharing knowledge generated from the Lesson Studies. There are three areas in which student-teachers could share the knowledge they gained from the Lesson Study. The first is the Lesson Overview Page. At the end of the teaching practice, student-teachers wrote the answer for the primary issue they investigated about their lesson. This can be seen in on the right side of Figure 3. Secondly, in their Lesson Research Page, shown in Figure 4, student-teachers wrote what they learned at the end of each day.

Figure 4

A Partial Extract of the "Hokkaido" Lesson Research Page
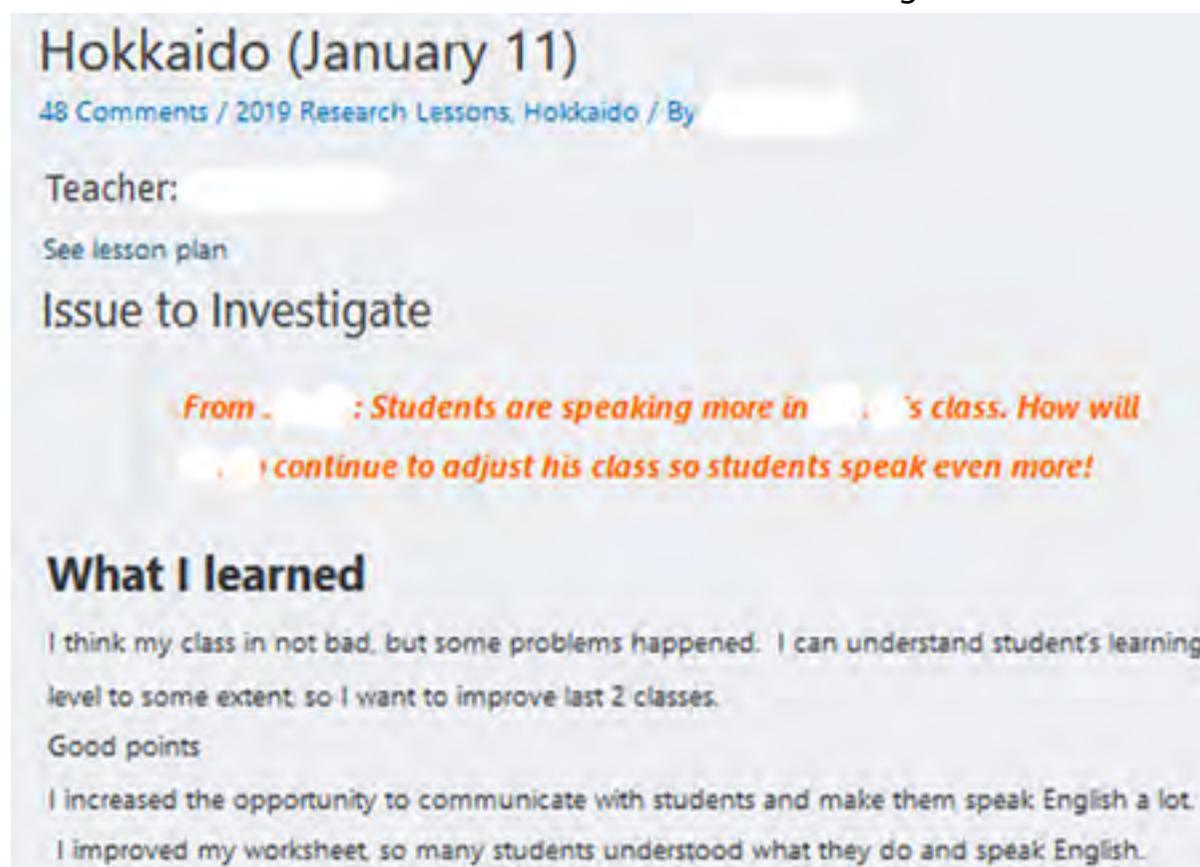
Student-teachers wrote in detail what they learned overall from the experience in their ePortfolios (Hall & Townsend, 2017), which were located on a different site. WordPress Multisite enables administrators to create a network of WordPress sites with just one installation. The LS APP occupied the primary site of the multisite **https://pls.edu.iwate-u.ac.jp** while the ePortfolios occupied a subsite **https://pls.edu.iwate-u.ac.jp/ep**. Figure 5 shows an ePortfolio for the Hokkaido Lesson. For the ePortfolio, student-teachers wrote six posts; three about how their teaching, language learning beliefs, and world view changed before and after going to Thailand and three about Critical Incidents, or experiences, that caused these changes. The posts are given a category, "[name]'s ePortfolio" and those six posts in the same category appear together on the ePortfolio site and constitute an ePortfolio. Student-teachers also give keywords to an entry by giving tags, which are written in blue below the heading.

Figure 5

   Screenshot of a Student's Teacher's ePortfolio for the Hokkaido Class
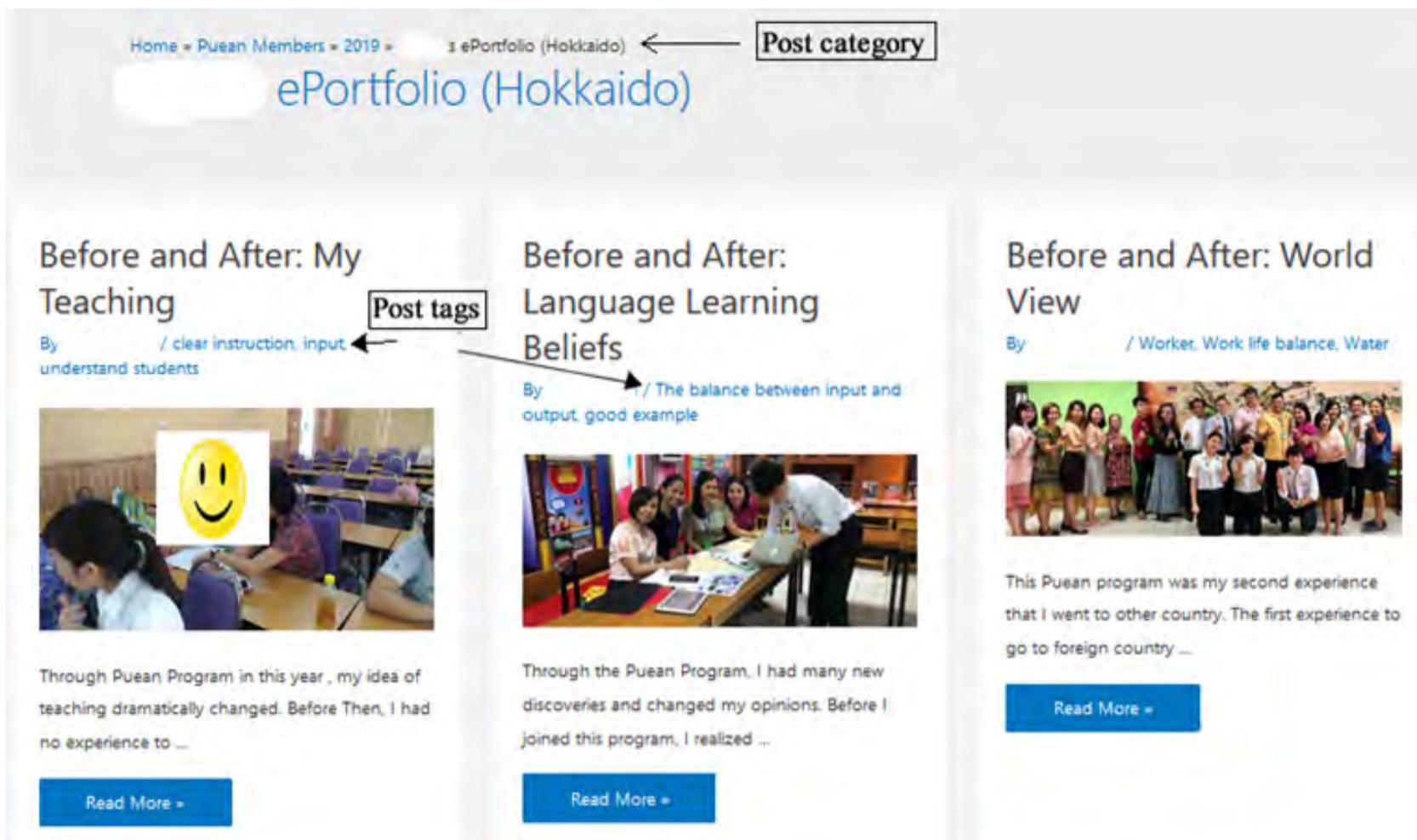
Overall, this section has attempted to explain how native features of WordPress, such as *menus*, *categories*, and *tags*, together with some plugins were used to organize a large volume of content in an accessible way for all members of the program. In order to provide relevant feedback to facilitate reflective practice, LS APP users needed to understand the teacher's pedagogical rationale behind the classes they would observe as well as the teacher's experiences up to that point.

Facilitating User Interaction on the LS APP

Table 2 shows the necessary features to facilitate interaction. First, users should be able to give and receive feedback on the LS APP providing evidence such as videos or pictures. Second, it was hoped that through user profiles and being able to track user comments, posts, and votes an online community of in-service and pre-service teachers discussing their craft could be facilitated to promote the collaborative element of reflective practice.

Table 2

   Facilitating User Interaction

Necessary Features	Enable users to give and receive feedback.	An online community: User profiles, overview of user activity.
WordPress Features/ Plugins	Plugin: WPDiscuz (comment, search, media uploader)	Enable users to give and receive feedback.
LS APP Area	Lesson Research Page	Member Pages, Lesson

Feature 1: Enable users to give and receive feedback. The foundational feature of the LS APP is giving feedback on lessons. This is accomplished through the *WPDiscuz* plugin. Figure 6 shows the comment form for a lesson research page on the top and a completed comment on the bottom. The comment form can be changed depending on the issues to observe of a lesson. The only required field on the comment form is the main comment (1). The WP Discuz media uploader enables observers to upload photo or video data (2). The third field is for entering the grade (Matthyom in Thai) and homeroom number of the class being observed. Fields 4 and 5 enable the users to quickly share good points or points to improve while fields 6 and 7 enable users to categorize their comments. In the actual comment, Person 1 has written in the main comment field and selected a category from the drop-down menu. The student-teacher who received the comment voted it was useful by giving it a thumbs up.

Figure 6
Comment Form for Giving Feedback (top) and an Example Comment (bottom)
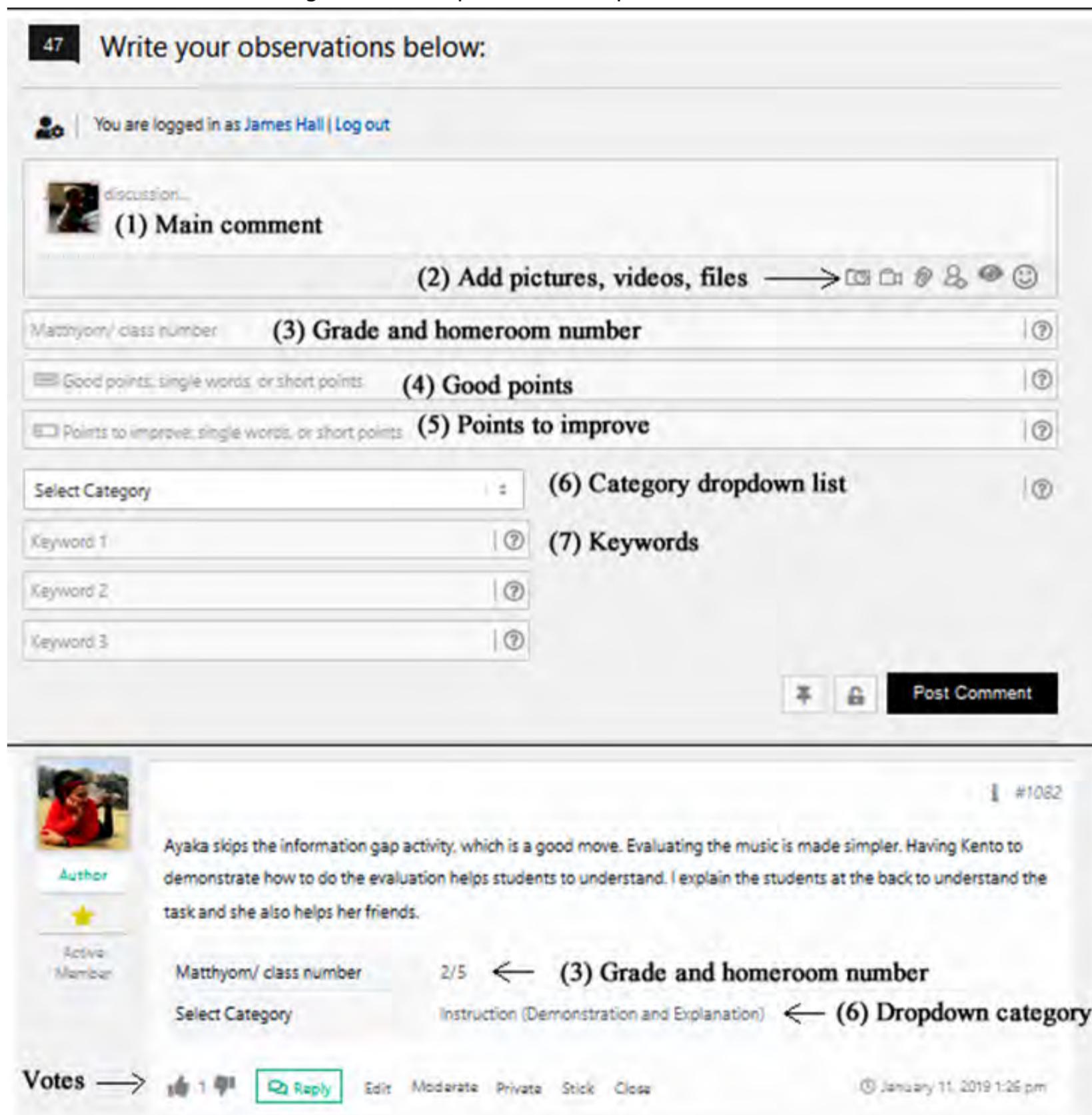
Feature 2: Creating an online community. The purpose of creating an online community was to enable school teachers, student-teachers, and university instructors to freely share their thoughts about teaching and learning as well as reveal a personal side of themselves. A site membership plugin called *Ultimate Member* enabled program participants to create profiles of themselves which consist of a profile picture, a short biography, and an archive of their posts and comments. Figure 7 shows an actual profile of the student-teacher of the Flower Card class; observations she made for the music class and the Hokkaido class are displayed.

Figure 7
Ultimate Member Profile for Person 2
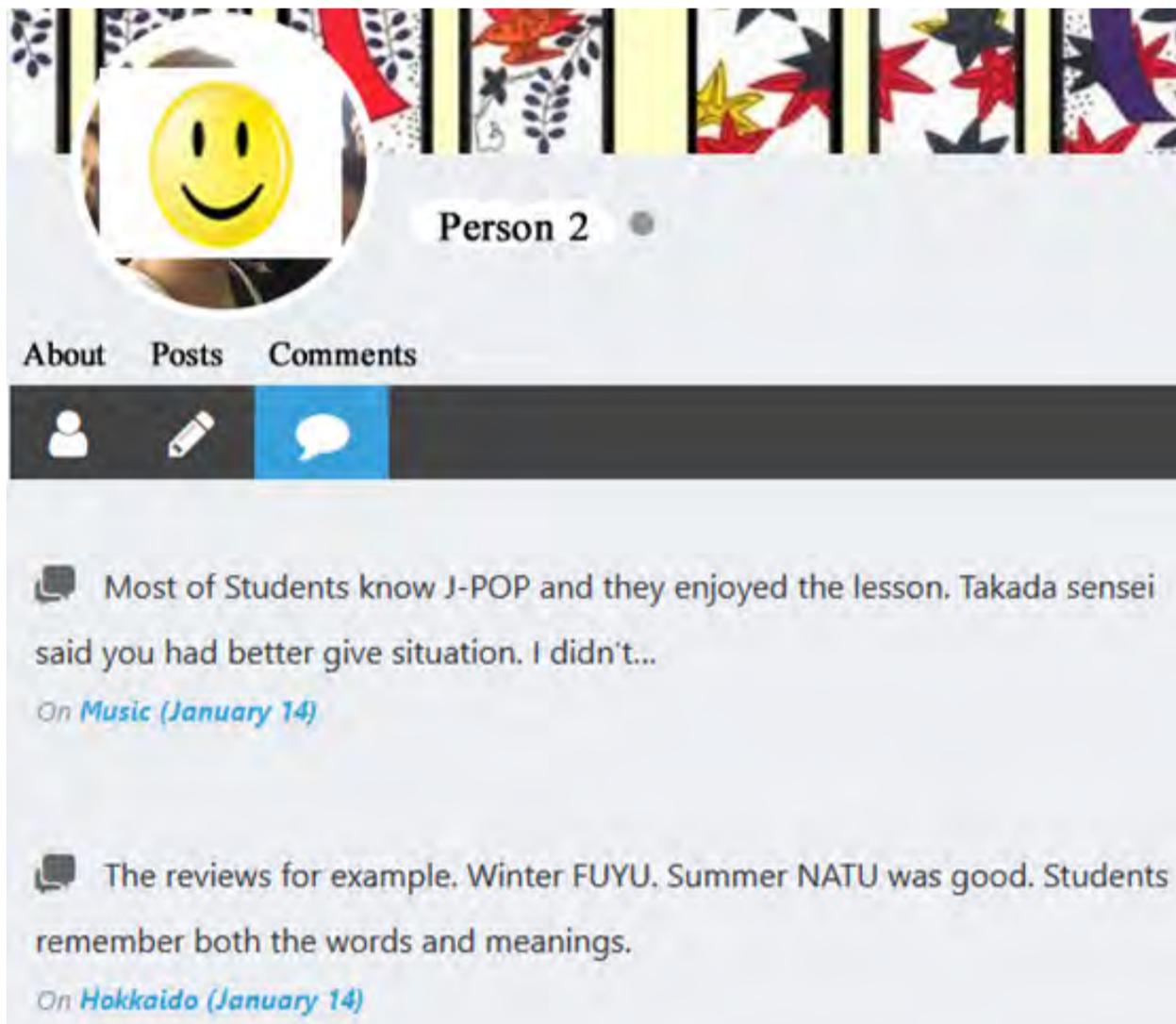
In addition to this, the *WPDiscuz* plugin has an extension called "Author Info" which provides commenting statistics on a site member. There is an overlap with the *Ultimate Member* profile pages, which also shows a list of comments that a user has written. Figure 8 shows the WPDiscuz profile for Person 2, who appeared previously. The primary benefit of these statistics is that it displays all the comments that student-teachers voted for. That is, it shows the comments that they considered to be informative feedback. Analyzing these can help determine the kind of feedback that student-teachers found useful.

Figure 8

Commenting Statistics of Person 2 from WPDiscuz
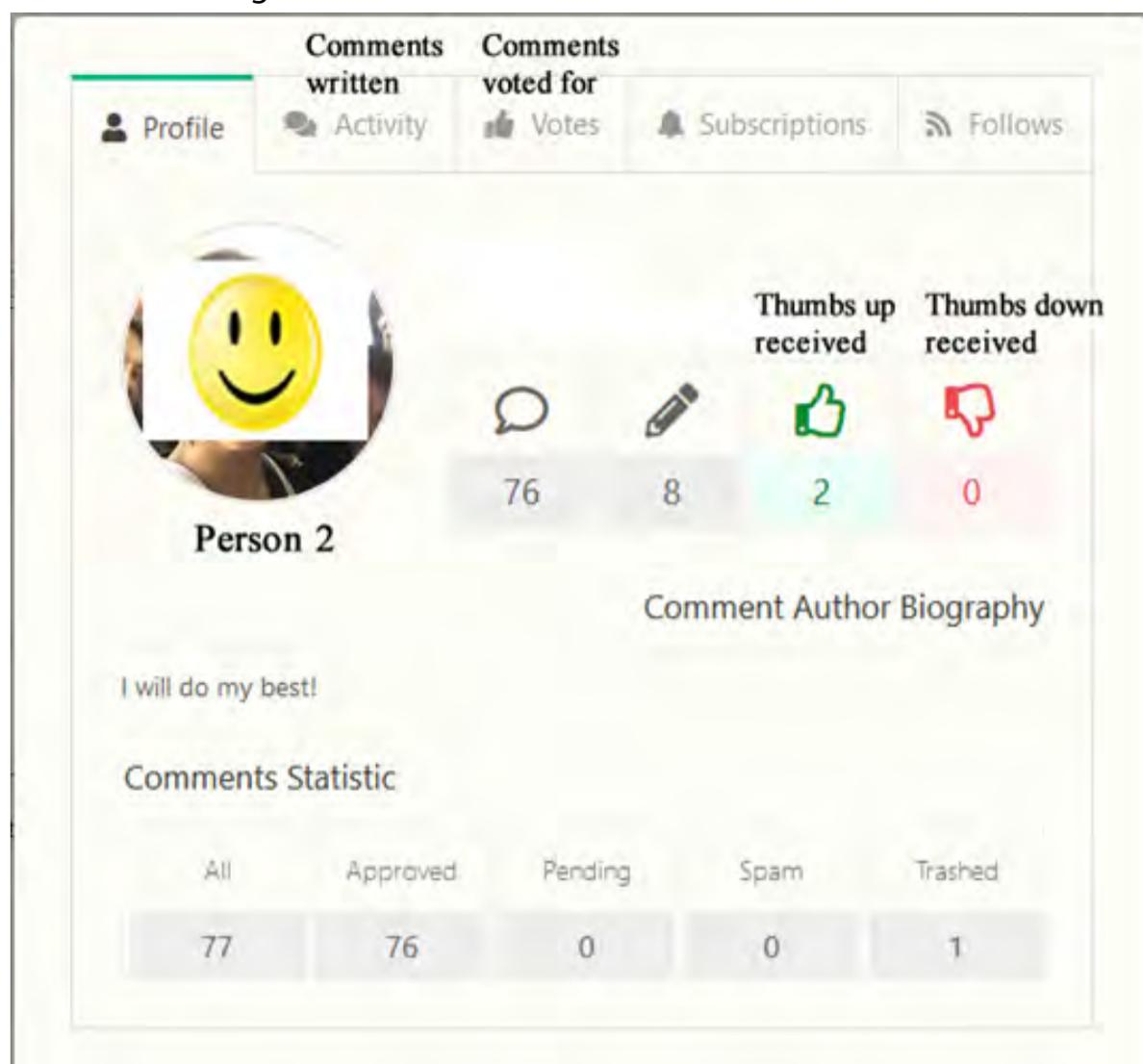
Privacy

The LS APP consists of video and photos of teachers and students as well as evidence of both successful and unsuccessful teaching. Therefore, it is essential that the content of the application be restricted to registered members. This has been a problematic issue in developing the LS APP, for which the resolution has required a higher level of technical knowledge. Using *Ultimate Member*, the administrator can restrict site access to only logged in users or restrict certain pages and posts. For the LS APP, all Lesson Research Pages, which consist of pictures and videos of lessons in the lesson feedback, are restricted to logged in users. Access to student-teacher ePortfolios is also restricted. However, media files uploaded to WordPress through native functions or any plugin have their own URLs. Therefore, if one could ascertain the URL of where the media files were located, they could access them even without being logged into the LS APP. Neither *Ultimate Member* nor WordPress block access to these URLs. Therefore, to ensure that these URLs could not be accessed by internet robots, code had to be copied and pasted into a server configuration file (HTACCESS) to deny access to media file URLs for users who were not logged in. This was the biggest demerit of using WordPress to serve as an LS APP.

Method

From January 7–18, 2019, the LS APP was used at two high schools in Bangkok, Thailand. There were 6 student-student-teachers who were all English education majors. Two were in their second year and four in their fourth year of university. There were a total of three instructors from a university in Japan, including the author. A total of 14 teachers from the schools in Thailand observed lessons and

wrote into the LS APP. The negative and positive aspects of using WordPress will be identified based on (1) the LS APP contributions of the student-teachers, teachers in Thailand, and instructors and (2) the author's field notes of the experience. The theoretical frameworks for justifying the positive and negative designations are Rodger's (2003) attributes for adoptability of innovations and frameworks for reflective practice.

Results

LS APP's Attributes of Adoptability

2019 was the second time the LS APP had been used at the schools in Thailand, the first time being in 2018. For the second time, there were a higher number of teachers in Thailand who used the APP (14 teachers compared to 3 in 2018) and a higher number of class feedback comments (165 compared to 32). There were also more comments by student-teachers compared to 2018. It is the author's belief that the 2019 version of the LS APP had better attributes for adoptability.

Table 3

Number of Program Members Giving Lesson Feedback Comments in Year 2019 (2018)

Teachers from Thailand	14	(3)	Student-teachers	6	(5)	University Instructors	3	(2)
Number of comments	165	(32)	Number of comments	282	(108)	Number of comments	477	(355)

Rodger's (2003) attributes for adoptability of innovations are the following: complexity; compatibility, trialability; observability, advantage of use. Compared to 2018, the most recent version of the LS APP was easier to use. In 2018, rather than WP Discuz, the LS APP developers used WordPress's native post function for writing class feedback. That year, most of the teachers from Thailand considered this to be too complex and declined to try the LS APP as only three teachers used it. This year, teachers from the Thai schools were quickly able to navigate to the day's Lesson Research Page and write a comment.

In terms of compatibility, the author frequently saw the school teachers confirming the lesson plans on the LS APP when observing a student-teacher's class. A lesson plan was always embedded into the day's Lesson Research Page meaning that opening the APP and going to the commenting page was compatible with being able to understand the rationale of a lesson one was observing. In terms of trialability, in 2019, the university instructors and I conducted workshops for school teachers and student-teachers. Everyone was introduced to the concept of reflective practice and lesson study; they practiced writing lesson comments and therefore they were able to trial the APP. Additionally, the student-teachers introduced their lesson to their Thai counterparts by showing them their Lesson Overview Pages. This is another way in which the LS APP was compatible with the teaching practicum. Further benefits of using the APP were that the student-teachers would refer to the comments to improve their lessons when there was not time to conduct a meeting about the lessons.

Although there were some advantages of use which led to more utilization of the LS APP in 2019, there were also many practical and developmental issues which must be overcome to successfully customize WordPress to serve as an LS APP. The primary issue lies in the APP's complexity. Successful use of the LS APP depends on users being able to operate it with minimal problems. First, users need to be able to go to the URL on their browser and enter their username and password. It was very common for users to forget their passwords and much of their attention was focused on trying to log in or the university instructors' attention was focused on issuing the users a new password rather than observing the class. Secondly, uploading media using the WPDiscuz Media Uploader worked inconsistently. One issue was the Wifi environment in Bangkok, as connectivity was different from Japan. Another issue was that some devices such as certain kinds of Android phones did not seem

compatible with the WPDiscuz Media Uploader. When the observers' attention is directed towards trying to get the APP to upload media during the class, then arguably they cannot do their most important job: observe the lesson and write feedback. A third issue is the server capacity required to host a WordPress multisite with up to 20 users at a time uploading media and writing comments. For the 2019 Thailand practicum, the LS APP developers used a shared server provided by a large hosting company. However, it did not have the necessary memory the LS APP required leading to difficulties in uploading media. A dedicated or virtual dedicated server is necessary to be able to accommodate the memory usage associated with the LS APP. This problem was resolved when the author moved the APP to the virtual dedicated server belonging to his university.

Another issue is the complexity of writing comments on an APP with which one is not familiar while observing a lesson at the same time. Some school teachers preferred to write into the LS APP during the lesson, rather, writing a comment at the ending. Others, declined to use the LS APP because they found it impossible. Ten school teachers were registered as users of the LS APP but never wrote any comments about the lessons. There is arguably a conflict between advantage of use and complexity of writing comments. The advantage of writing comments is that it serves as a valuable reference for student-teachers, however, it requires fast typing on a device and multitasking which is too complex for some observers.

A last issue is the number of settings that must be made for *Ultimate Member* and WPDiscuz. The benefits of these plugins are that they are highly adaptable because they offer hundreds of options which enable administrators to customize the plugin to fit their needs. However, having to learn all the different options and determine which settings best serve the purpose of the LS APP is a never-ending process. Furthermore, there have been numerous incidents where a faulty setting prevented users from accessing a page or being able to leave a comment properly and it took the university instructors' attention away from the classes as they grappled with the settings of these plugins. In summary, both the LS APP user and administrator have to be able to navigate through various complexities to utilize the APP. For usage of the LS APP to continue, its advantages of use must outweigh its complexities. The advantage of use will hinge on the extent to which the LS APP encourages reflective practice.

Reflective Practice and the LS APP

Earlier, reflective practice was defined as a continuous process of self-improvement which was evidenced based, referred to theory, and collaborative. It was hoped that the LS APP would encourage this kind of reflective practice. The LS APP shows signs of evidence-based reflective practice. For example, Figure 9 shows an ePortfolio entry which hyperlinks to a lesson comment to provide evidence of an issue.

Figure 9

An ePortfolio Entry Provides a Hyperlink to a Lesson Comment

In terms of collaboration, there was evidence of all six teachers in the program utilizing the lesson feedback comments to improve their lessons. However, while student-teachers were able to use the LS APP to give and receive feedback, they often did not write "What they learned" on their Lesson Research Pages (the rate of completion was 50%). As Van Manen (2008) wrote, teachers often do not have time to reflect during a day of non-stop work. However, often they are cognizant of issues and make appropriate changes. In summary, student-teachers were able to quickly make use of the feedback on a daily basis, but they were not able to consolidate what they had learned by writing a summary. The feasibility of student-teachers writing a reflection every day into the LS APP should be reconsidered.

Third, it was hoped that the LS APP would facilitate an online community in which users could get to know each other and exchange ideas about teaching. It was hoped that profile pictures, such as the one shown in Figure 6 would help the school teachers and student-teachers identify one another and lead to a closer community. However, of the 40 registered users of the APP during the 2019 practicum, only 16 created profiles for themselves. The majority of users thus used the LS APP to quickly write lesson comments or receive information about the lesson. However, the LS APP is unlikely to have helped users better know the identities of one another.

Lastly, reflective practice is supposed to be compatible with pedagogical theory; and the theory being targeted was CLIL as well as enhancing our understanding of national curricular English learning standards of Thailand. However, no lesson feedback comment by student-teachers or the school

teachers referred to CLIL or Thai curricular standards nor did their ePortfolios. This was also never a topic in the Lesson Studies that were conducted. Rather, immediate issues of focus for student-teachers were techniques or activities they could use or measures they could take to improve student engagement of their lessons. In other words, student-teachers were most preoccupied with conducting an engaging lesson and school teachers were most preoccupied in helping them accomplish this objective. Therefore, the LS APP was not used as a means for reflecting on the theory which served as the foundation for the lesson planning. This finding, however, is compatible with previous research done on teacher development. That is, teachers with less experience are more likely to prioritize craft knowledge, techniques and conducting a smooth class, rather than examine the wider significance of their instruction (Edge, 2011; Farrell, 2016; Hall, 2017).

Conclusion

Implications

As an LS APP, WordPress can be effective for organizing information and making it accessible. Also, the plugins give it an interactive element in which student-teachers, school teachers, and university instructors can give and receive feedback on lessons. This gives student-teachers data which they can use to conduct evidence-based reflection. In this sense, the LS APP is compatible with collaborative and evidence-based reflective practice which is the goal of the teaching practice.

The 2019 version of the LS APP which has been analyzed in this article, arguably is more conducive to adoptability than the 2018 version. However, there are substantial issues and challenges that must be minimized if the use of the LS APP will continue. These include technical issues such as media uploading and appropriate hosting as well as the large amount of time spent on troubleshooting and how this can interfere with the instructors' observing and mentoring the student-teachers. Other issues concern the complexity of using the APP for users. The fundamental issue is whether or not the benefits outweigh the issues to make continuous usage of the LS APP worthwhile.

Limitations

Although this article has focused on an instance of the LS APP catered to a very specific program, Japanese university students teaching English in Thailand, other teacher educators wishing to make use of WordPress will likely experience similar issues: Is the technological innovation simple enough to use? Is the innovation helpful? Are the benefits observable? Do users have a chance to trial it? Is the innovation compatible with program goals? In addition to this, WordPress is an open source Content Management Systems whose vast number of plugins make it amenable to a variety of uses. Case studies like this can contribute to the understanding of educational applications of WordPress.

Lastly, this article will end by discussing a specific limitation and directions for possible future research. This purpose of this article has been to show how WordPress can be configured into an LS APP as well as share some of the benefits and drawbacks of this kind of application. However, the findings have been based on the author's own observations and data on the LS APP usage. To better understand the benefits and drawbacks of the LS APP, it will be necessary to give a questionnaire to users to better understand their perspectives. In future studies, the author will investigate the experience of using the LS APP from the perspective of the user as well as the knowledge that they have generated.

References

Edge, J. (2011). *The reflexive teacher educator in TESOL*. Routledge.

Farrell, T. S. C. (2016). *From trainee to teacher reflective practice for novice teachers*. Equinox Publishers.

Farrell, T. S. C. (2019). "My training has failed me": Inconvenient truths about second language teacher education (SLTE). *TESL-EJ, 22*(4), 1–16.

Hall, J. M. (2017). *A linguistic ethnography of learning to teach English at Japanese junior high schools*. (Unpublished doctoral dissertation), University of Stirling. http://hdl.handle.net/1893/26002

Hall, J. M., & Townsend, S. D. C. (2017). Using critical incidents and e-portfolios to understand the emergent practice of Japanese student-teachers of English. *Teaching and Teacher Education, 62*, 1–9. https://doi.org/10.1016/j.tate.2016.10.017

Lewis, C., Perry, R., & Murata, A. (2006). How should research contribute to instructional improvement? The case of lesson study. *Educational Researcher, 35*(3), 3–14.

Mann, S., & Walsh, S. (2017). *Reflective practice in English language teaching: Research-based principles and practices*. Routledge.

Moon, J. A. (2004). *A handbook of reflective and experiential learning*. Routledge Falmer.

Nutthall, G. (2007). *The hidden lives of learners*. NCZER Press.

Pollard, A., & Pollard, A. (2014). *Reflective teaching in schools*. Bloomsbury.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Sabin-Wilson, L. (2017). *WordPress ALL-IN-ONE for dummies*. John Wiley & Sons, Inc.

Sato, M., & Sato, M. (2003). Kouristu chuugakkou no chousen jugyou wo kaeru gakkou ga kawaru [The challenge of public schools: Changing class to change the school]. Gyousei.

Usui, Y. (2011). What is lesson study? In National Association for the Study of Educational Methods (Ed.), *Lesson Study in Japan* (pp. 3–14). Keisuisha.

Van Manen, M. (2008). Pedagogical sensitivity and teachers practical knowing-in-action. *Peking University Education Review*, 1–23.

W3Techs. (2019, July 28). Usage statistics and market share of WordPress. https://w3techs.com/technologies/details/cm-wordpress/all/all

Author's Information:

James M. Hall has been living in Japan for 20 years and a faculty member at Iwate University for 17 years. He belongs to the Faculty of Education. His research interests are teacher education, teacher development, and using technology to enhance both. He is from Boston, MA in the USA.

Email: jhall@iwate-u.ac.jp

4

Exploring Student Collaboration Strategies through Digital Storytelling Films Created with Mobile Devices

Bradley Irwin, Nihon University

Abstract

This study investigates collaborative strategies employed by university students when tasked with creating a complex, multi-phase digital storytelling film project using mobile devices. The objectives of the study were two-fold: to better understand the collaborative approaches learners adopt to complete project-based film creation tasks on mobile devices; and, to investigate students' perspectives and opinions related to this type of collaboration. Eighty-three first-year undergraduate English language learners at a Japanese university participated in this exploratory case study. Quantitative and qualitative data from seventy-nine of the participants were collected through online surveys and questionnaires, classroom observations, and post-project debriefing interviews. This study identified several significant findings. At the outset of the project, negative comments on collaboration tended to focus on perceived personality traits of other group members. As students continued working together, this focus shifted to project-oriented issues such as workload distribution and contribution recognition. A second finding showed that students were willing to sacrifice the quality of their final product to avoid certain awkward aspects of collaboration such as negotiation or consensus building. These findings highlight the importance of preparing students for the challenges of collaboration when completing complex tasks in groups or teams.

この研究では、モバイルデバイスを使用して複雑でマルチフェーズのデジタルストーリーテリング映像プロジェクトを作成することを課題としたときに学生が採用したコラボレーション戦略について調べます。この研究の目的は2つで、モバイルデバイス上でのプロジェクトベースの映画制作タスクを完成させるための学習者の協調性アプローチの理解及び、このコラボレーションに関する学生の見解と意見の調査です。この探索的なケーススタディには、日本の大学の1年生83人の英語学部生が参加しました。定量的および定性的データは参加者のうち79人から、オンライン調査およびアンケート、教室での観察、およびプロジェクト後の報告会見のインタビューを通じて収集されました。この研究においていくつかの重要な発見を確認することができました。まず、プロジェクトの開始時、否定的なコメントは他のグループメンバーの知覚される性格の特徴に焦点があてられている傾向があったが、学生が一緒に作業を続けるにつれこの焦点が作業負荷分散などのよりグローバルな問題にシフトされていきました。次に、交渉や意見の同意等の扱いにくい側面を回避するために完成製品の品質を犠牲にしても構わないと思っていることが示されました。これらの調査結果は複雑なタスクを完了させる際、学生がコラボレーションの課題に挑戦できるように準備をさせることの重要性を意味するといえる。

Keywords: CALL, MALL, digital storytelling, project-based language learning

Digital storytelling differs from more traditional forms of storytelling in that it "combines the art of telling stories with a mixture of digital media, including text, pictures, recorded audio narration, music, and video" (Robin, 2016, p.18). A prolific researcher in the educational implications of digital storytelling, Robin (2006) has classified digital stories into three distinct categories: personal narratives, historical documentaries, and stories that inform or instruct.

The collaborative project-based digital storytelling videos described in this paper fall into the third category highlighted by Robin, those that inform or instruct. For the purposes of this study, digital storytelling is defined as a story that informs about a particular topic which is created through a combination of digital material, including video clips and digital photos, accompanied by voiced narration. These stories also contain stylistic elements such as subtitles, digital animation, animated text or graphics, and soundtracks used to add depth and meaning to the topics presented.

While most practitioners of digital storytelling would likely agree that the stories produced are more important than the technology used to produce them, there has been one significant technological advance in recent years that cannot be ignored when discussing digital storytelling, the development of smartphones. Prior to the arrival of smartphones with powerful cameras and intuitive video editing software applications, teachers and students alike needed a sophisticated level of technical knowledge to operate camera equipment or manipulate digital media using non-linear editing software. This high level of technical understanding is no longer a hurdle that educators face when implementing aspects of digital storytelling projects in learning environments. In fact, the ubiquitous nature of pocket-sized, high resolution cameras with built-in video editing software has led to the current phenomena of most students having portable, easy-to-use, and readily accessible recording devices always on hand. Moreover, the prevalence of social networking applications on these devices, such as YouTube, Instagram, and Facebook (among others), mean that many young learners have been exposed to the concepts of content recording, editing, and sharing that are key elements to digital storytelling.

In spite of this paradigm shift in production capabilities related to digital storytelling, this researcher is unaware of any published studies that have focused on using smartphones to record, edit, and share collaborative digital storytelling projects. The study presented in this paper will address this gap in the literature by describing practical issues related to collaboratively produced digital storytelling videos that participants created using nothing more than their smartphones.

Theoretical Perspective

According to Robin (2016), several aspects of digital storytelling are "particularly well suited to the constructivist classroom" (p. 20). Smeda et al., (2014) argue that digital storytelling promotes a constructivist approach to learning because of its emphasis on social dimensions of learning in authentic situations. From a similar theoretical perspective, as digital storytelling is a multi-phase, student-centered learning activity with an emphasis on creating tangible and meaningful learning artifacts, it aligns with Harel and Papert's (1991) constructionism theory. Sometimes referred to as "learning-by-making" (Papert & Harel, 1991, p.1) learners co-construct meaning by engaging in social interaction during group work, project collaboration, and through an awareness of a wider audience as they create a product.

21st Century Skills

Researchers have pointed to the benefits of students taking ownership of their digital artifacts as having positive impacts on motivation, task engagement, critical thinking and other 21st century skills such as digital literacy or collaboration (Dumova, 2008; Lord, 2008; Yuksel et al., 2011). In a year-long study on 10th grade English language learners, Yang and Wu (2012) found that students in a digital storytelling group performed significantly better in terms of motivation, critical thinking abilities, and language learning achievements than a similar group of students engaged in traditional, lecture-based language learning. In a study of even younger learners, elementary school students who participated in a digital storytelling project were found to have increased learner motivation, problem solving skills, and learning achievement (Hung et al., 2012).

Collaboration is another 21st century skill that has been investigated by several researchers. Nordmark and Milrad (2012) describe a digital storytelling project that involved a creative collaborative approach to produce stories using iPod touches. The authors of this study showed that students could successfully collaborate to produce stories in authentic contexts and that students were generally positive about their co-creation experiences. Lu et al. (2011) designed an innovative digital storytelling system called *ShadowStory* that allowed students to use tablets to create shadow puppets and to perform live stories together. Their findings indicated that *ShadowStory* promoted creativity, collaboration, and a deeper cultural understanding of traditional Chinese shadow puppet narratives, on which the software was based.

Benefits on Language Learning

Several studies conducted on language learners found that digital storytelling improved oral proficiency, speaking skills, listening skills, and even writing skills. Kim (2014) collected both qualitative and quantitative data during an experimental study on ESL learners. It was found that not only did participants develop and improve their speaking skills, they were also able to build substantial confidence in their ability to speak English (Kim, 2014). Hwang et al. (2016) found that learners who used an interactive, web-based multimedia system were able to significantly outperform students who did not use the system in terms of speaking performance. In a separate study on Iranian undergraduate EFL learners, researchers found that students who utilized digital storytelling narrative techniques developed better oral skills than students in a control group who made presentations on a similar topic in a classroom (Razmi et al., 2014).

While many studies have pointed to the benefits of digital storytelling on oral skills, others identify positive impacts on listening skills. Verdugo and Belmonte (2007) conducted an experiment that examined the effects of digital storytelling on listening comprehension with 220 young Spanish speaking learners of English. Their results showed that digital storytelling had a significant effect on the listening comprehension skills of the experimental group and that they outperformed the control group on a test at the conclusion of their study. Examining a similar age group of English language learners in Malaysia, researchers found a significant difference related to the listening skills of participants who utilized digital storytelling while learning English with those who did not (Abidin et al., 2011).

Xu et al. (2011) took a novel approach to examining the writing process associated with digital storytelling by dividing participants into two groups; one that created digital stories in Second Life, and one that created digital stories off-line. The researchers found a significant difference between the writing skills of each group and concluded that digital stories created in a virtual learning environment, like Second Life, can be an effective way to teach writing.

Objectives

The aims of this study were two-fold. First, there are few, if any, published studies that have explored the practice of using mobile devices exclusively to create, edit, and publish collaboratively produced digital stories in language learning environments. To address this gap, the present study investigated the collaborative strategies that participants employed while using mobile devices to create interesting and engaging digital stories. In order to enhance collaboration during this type of project-based learning task, a second objective was to identify limitations by examining students' perspectives on the creative process. Therefore, two research questions were proposed:

1. What collaborative strategies do language learners employ when creating digital storytelling projects using mobile devices?
2. Can students' perspectives and opinions on their collaboration experiences be used to elucidate any shortcomings with this approach?

Method

To effectively address the proposed research questions, a mixed method case study approach that utilized qualitative and quantitative data was deployed. Qualitative data were collected through classroom observations, open-ended survey questions, and individual debriefing sessions at the conclusion of the project. As for quantitative data, students completed self-assessment questionnaires using five-point Likert scale items to assess the degree to which they agreed or disagreed with a set of statements created by the researcher. Both the open-ended survey questions and self-assessment questionnaires were optional and completed by participants using an online anonymous form.

Participants

Participants in the study were 83 first year undergraduate students majoring in International Studies at a mid-sized university in a rural area of Japan. The digital storytelling video project was conducted as a graded assignment in a compulsory English course during the spring semester (April to July) in 2018. The students were from three separate classes taught by the researcher of the present study. The students' English levels were assessed at between A2 to B1 on the Common European Framework of Reference before the start of the school year using the ACE placement test. While the digital storytelling video was an assigned project, the debriefing interviews were optional while the online questionnaire was both optional and anonymous. A total of 79 students completed both the debriefing interview and anonymous questionnaire. The remaining 4 students were either absent or declined to participate in the interviews and surveys.

Project Design

The overall learning objective of the digital storytelling project was to have students work together to create short films (approximately 5 minutes in length) in English about the university town in which they were studying. The justifications for designing this project were to help enhance students' awareness of the local community, to improve their English communication skills, and to foster a sense of teamwork through collaboration. As a complex digital storytelling project of this kind demands a wide range of skill sets from participants, the project was divided into distinct phases. Five separate phases were identified to successfully complete the project. The five phases are as follows: the explanation phase, the research phase, the drafting phase, the filming phase, and the feedback phase. Each phase is described in further detail below.

Explanation Phase

This phase represents the only point during the project that was not entirely student-centered. In this phase, a completed example of a digital storytelling video created by the instructor was shown to the participants. Students were then divided into groups of three or four and the task was explained. Finally, the instructor demonstrated how the video was made using only a smartphone and the iOS app *Clips*. In order to encourage authentic creativity and collaboration, the instructor was not overly prescriptive in terms of a set method for creating the video. Therefore, students were free to use any video recording or editing apps that they liked as long as the videos were recorded and edited with smartphones. The instructor was sure to follow the same procedure when explaining the digital storytelling projects to each of the three classes.

Research Phase

During the research phase, students were instructed to establish criteria amongst themselves to decide on a location to film. Criteria used to determine the location within the city to film included such considerations as: cultural and historical significance, unique features that might be appealing to tourists or visitors, distance to the location, accessibility via public transportation, and any fees or costs related to travel or admission. Some groups placed a heavier emphasis on criteria that appealed to visitors or tourists and selected popular sites such as cafes, restaurants, and a newly built suspension bridge overlooking the city. Groups that focused more on cultural or historical significance determined that a well-known Shinto shrine, a former imperial home and its surrounding garden, and nearby parks and forests would be ideal locations for producing their digital stories.

After selecting their video locations, groups set about the task of compiling information that would be included in their digital stories. The most common research methods were Internet-based searches of local tourism websites, Wikipedia pages, or official homepages of the locations. In some cases, students used online reviews to help determine the focus of their video content.

Drafting Phase

In this phase, students were instructed on the proper use of storyboards for planning the visual aspects of their video as well as the importance of drafting narration scripts before travelling to their locations.

Filming Phase

In the final creative phase of the project, students travelled to their locations to film their digital storytelling videos. With the filming completed on-site, all but one of the groups decided to edit their videos during their free time as homework. Having travelled to a distant location by bus, the remaining group used the approximately 45-minute return trip to edit their video.

Feedback Phase

While formative instructor feedback had been ongoing during the research and drafting phases, summative peer feedback was provided at the conclusion of the project. Once completed, the videos were uploaded to a shared Google Drive folder. Students watched their peers' videos and used a scoring rubric created by the instructor to evaluate each project. The scoring rubric distributed to the students during the explanation phase was adapted from a sample rubric provided on website *The Educational Uses of Digital Storytelling* **http://digitalstorytelling.coe.uh.edu/archive/pdfs/samplerubric.pdf** hosted by the University of Houston. Therefore, students were aware that their videos would be for a wider audience than just their instructor and that their peers would be providing evaluative feedback.

Results

As the main goal of this study was to have students work together to create a digital story in the form of a video, they were encouraged to collaborate during each phase of the project. Therefore, aside from the explanation phase, which was not a student-centered activity, the participants were found to have actively collaborated in a variety of ways. Qualitative data focusing on collaboration throughout the research and drafting phases were collected by the researcher during in-class observations and individual debriefing sessions at the conclusion of the project. Since the researcher was not present during the filming phase, students reported on their collaborative approaches through

self-assessments surveys. During the post-project debriefing sessions, students were not only asked to describe the collaborative methods they employed while creating their digital stories, but to also give their thoughts and opinions about this process. These data points were then coded and compared to elucidate any patterns or common strategies students used to facilitate effective collaboration during project-based language learning tasks focused on mobile devices.

Research Phase Collaboration

During the research phase, students worked together to establish criteria they could use to determine an appropriate location that could be the focus of their film project. The criteria students used in selecting their locations included considerations such as: historical and cultural significance, unique events or activities, availability of online resources, and accessibility issues that included distance to the site or the availability of public transportation. After the groups had compiled sufficient information relating to their topics, they analyzed their research to determine items that required further elaboration or removed superfluous and redundant information. Collaboration during this phase was organized and systematic in nature and followed a traditional, democratic approach that centered on group negotiation, agreement and consensus building. Students had varied opinions about the collaboration process during this phase of the project. Below are some relevant opinions relating to research phase collaboration. Parentheses have been added by the researcher for clarity.
1. "It was very difficult for me, but I could understand the importance of communication."
2. "Some people (are) dependent on another classmate. They are passive work(ers)."
3. "A lazy student is apt to not work. So, we should make groups more carefully."

Drafting Phase Collaboration

During the drafting phase, students began to divide tasks and assignments based on their abilities or skill sets. As students were required to create a storyboard to depict various scenes, and scripts for the narrated sections of their videos, group members who were more artistically inclined drew rough storyboard sketches while students with stronger language skills drafted narration scripts. Even though students had been encouraged to complete each phase of the project using their mobile devices, 2 out of 23 groups (n = 6) seemed reluctant to do so and opted for a paper and pencil solution during this phase. When asked to explain the reasons that they chose not to use their devices, two reasons were given. Four students replied that they felt more comfortable using pencil and paper and had no experience using app-based drawing tools while the remaining two students replied that since it was usually forbidden to use mobile devices in class, they felt uncomfortable doing so.

When drafting their scripted narration, students shared documents using the mobile version of the Google Docs app. This app proved particularly useful for collaborative script writing as the text writing is synchronous and updates in real time. Students could literally watch what their classmates were typing on their own device screens. Students were very positive about this approach to writing. Below are some relevant opinions relating to drafting phase collaboration. Parentheses have been added by the researcher for clarity.
1. "I think this activity gave me a chance to communicate with some people who I have never talked (to), and we could cooperate with each other."
2. "I think this group work is good because when we enter society, we must create things in (a) group."
3. "This activity was suitable for improving teamwork."

Filming Phase Collaboration

Finally, the filming phase proved to be the most interesting stage of the collaborative process because students had to work out how they would film and edit each scene of their video using their mobile devices. At the same time, they had to try to make sure that the amount of work between each member was divided as evenly as possible. Since it was not possible for the researcher to be present to observe each group during the filming phase, participants were requested to complete an anonymous online survey to collect data concerning collaboration strategies. Two distinct patterns emerged and are described below.

The most common collaborative strategy described by respondents (n = 51) involved using a single smartphone to film each section of the digital story. Using this approach, the owner of the smartphone was usually designated the "camera person" and filmed most of the project themselves. However, since each member of the group had been instructed to appear in the videos, students also described occasionally passing around the smartphone while filming. Participants who used a single smartphone to film their projects would then work together during the editing phase to decide which scenes to include or omit and to add appropriate subtitles or stylistic elements. Students described this method as somewhat difficult because they had to negotiate with one another to build a consensus about the edits.

When asked about why this strategy was adopted, the most common response (n = 32) was that it seemed easier to have all of the video data on one device. The second most common reason (n = 12) for opting for single device collaboration was technology related. As one member of the group had the latest version of a particular smartphone, that phone's camera had the highest specs and could use elements of some video recording apps, such as *Clips*, that were not available to older smartphones. The remaining respondents (n = 7) stated that it seemed too troublesome to try and share data between Android and iOS users.

The second most common (n = 28) collaborative strategy described by participants involved using multiple smartphones to film the digital story. Using this approach, each member of the group would film scenes that they had created during the drafting phase on their own smartphones. Once the scenes had been shot, individuals would edit their own sections, deciding on which stylistic elements to include or omit. Each member would then transfer the data to a single device where the scenes were compiled and published. Participants who opted for this strategy described the creative process as being relatively smooth since they did not have to build consensus with other members. However, this approach gave rise to several problems that the single device groups did not encounter. For example, several students (n = 12) spoke of being dissatisfied with a seemingly disjointed final product because stylistic elements such as subtitle styles or fonts did not match and there was an obvious difference in video and audio quality between scenes. In fact, three groups (n = 9) had to download the data files from each device to a computer because some of the file types were not compatible when trying to compile each scene into a final product.

When asked to describe their reasons for using multiple devices to film their projects, responses varied considerably. The most common response (n = 10) was that students had had experience using different apps on their smartphones to make short movies and that they wanted to continue using those apps. The next most common response (n = 9) was that students wanted to be completely in charge of the scenes they had scripted or that they had a creative vision they wanted to see through. The remaining students (n = 9) couldn't clearly explain why they had chosen to use multiple devices to film their projects.

Students' Perception on Collaboration

Students expressed a wide range of opinions regarding collaboration during the digital storytelling project, some positive and others negative. Their focus on various aspects of the collaborative process

are also notable. Below are relevant samples of their thoughts and opinions. Japanese responses have been translated by the researcher. Words or phrases in parentheses have been added by the researcher for clarity.

Positive Opinions

1. "It (digital storytelling project) is very meaningful because teamwork makes a lot of trust."
2. "仲間と協力して事に取り組むいい経験だと思う。I think it's a good experience working with others."
3. "I think through this project, students can pay attention to their teamwork in the future."
4. "友達とも協力して行うこともでき仲を深めることができた。I could work with my friends and deepen our relationships."
5. "このプロジェクトを通して、まだ仲良くなれていない人とも仲良くなることができ、これからの英語の授業がさらに楽しくなりました。Through this project, I was able to get along well with people I wasn't already acquainted with and my English lessons have become more fun."

Less than Positive Opinions

1. "メンバーの仕事量に差がでたとき、それを測る機能がないこと。When there is a difference in workload between members, there is no way to measure it."
2. "Some people or the other groups couldn't get along with their classmates. This can happen sometimes because not all of the students in the class can do well with all of the students. However, it is surely going to be a great experience to improve each student's relationship."
3. "グループメンバーの選出が完全にランダムなので、個々人のやる気の差でどうしてもそれぞれの仕事の負担に差ができてしまう。その点も含めてうまくやれるように、という意味を含んでいるのかもしれないが、やる側としてはやはりストレスを感じる場面もあった。Since the selection of group members is completely random, there are differences in motivation between individuals which inevitably result in differences in individual workload. Considering this point, it is reasonable to have expected that students would cooperate and help each other; however, this did not always occur and sometimes caused stressful situations."

Discussion

This study showed that students utilize a variety of strategies when completing collaborative project-based activities such as the digital storytelling video project described above. A range of opinions and perspectives on collaboration are also evident in the responses that students shared when asked open-ended questions about their group work experience.

For example, although there were only a limited number of negative comments, there was a perceptible shift in the focus of the negative comments as students spent more time working together. At the outset, such comments towards other group members as being "dependent", "passive" or "lazy" focused more on perceived personality traits. Towards the conclusion of the project, negative comments attributed problems to differences in workload and recognition for individual contributions.

The collaborative strategies students adopted for creating their digital storytelling projects during the filming phase also produced interesting results. Students who employed the single device strategy for filming indicated that although communication, negotiation, and consensus building were at times difficult and stressful, they were satisfied with the completed projects. Indeed, the quality of videos produced using this approach were noticeably higher than groups who created their videos using multiple devices. Groups who adopted a multiple device strategy for filming did not experience some of the uncomfortable communication or negotiation conflicts discussed by the single device groups. However, they did so by reducing the instances of group collaboration which resulted in an adverse

effect on the completed project. Students in the multiple device groups were also more likely to voice dissatisfaction with the final versions of the videos they produced than students in the single device groups.

Conclusion

As this study showed, when students are allowed to devise their own collaborative strategies to complete a complex digital storytelling project two patterns emerge, a single device strategy and a multi-device strategy. The single device strategy forced students to engage in aspects of collaboration that they found difficult, such as negotiation and compromise, but these students reported higher levels of satisfaction with the finished project. The multi-device strategy allowed students to avoid the uncomfortable aspects of collaboration but led to higher levels of dissatisfaction with the finished project.

Student perspectives on their collaborative experiences also gave insights into some shortcomings that can be addressed when implementing a digital storytelling project such as the one described in this paper. Students recognized that group make-up and recognition of individual contributions were two areas that can be adjusted to improve the overall project. Rather than choosing groups at random, a set of criteria could be established to allow students the opportunity to work with group members who complement their strengths. If students are given some control over the make-up of their groups, they may feel more responsibility towards each other to make an equal amount of effort. Instructors could also adopt evaluative criteria that recognize individual contributions in order to motivate students to contribute equally to the project's successful completion.

The findings of this study imply that, given the opportunity, some learners will sacrifice the quality of their finished projects to actively avoid negative elements associated with collaboration or teamwork. Rubino et al. (2018) came to a similar conclusion in their study of the impacts of the collaborative process on the effectiveness of digital storytelling as a classroom tool. To maximum learning outcomes, students need to be made aware that while some aspects of collaboration, such as negotiation, compromise, or consensus building may be uncomfortable, they are essential skills needed for successful teamwork. With this in mind, instructors should encourage students to face these challenges head on. Instructing students on the potentially negative elements associated with collaborating on complex projects and basic techniques for resolving these issues could go a long way to improving the collaborative process.

References

Abidin, M. J. Z., Pour-Mohammadi, M., Souriyavongsa, T., Tiang, C. D. B., & Kim, N. O. L. (2011). Improving listening comprehension among Malay preschool children using digital stories. *International Journal of Humanities and Social Science, 1*(14), 159–164.

Dumova, T. (2008). Using digital video assignments as a tool for active learning. *International Journal of Learning, 14*(12), 63–71.

Harel, I., & Papert, S. (Eds.). (1991). *Constructionism.* Ablex Publishing.

Hung, C. M., Hwang, G. J., & Huang, I. (2012). A project-based digital storytelling approach for improving students' learning motivation, problem-solving competence and learning achievement. *Journal of Educational Technology & Society, 15*(4), 368–379 http://www.jstor.org/stable/jeductechsoci.15.4.368

Hwang, W. Y., Rustam S., Hsu, J. L., Huang Y. M., Hsu, G. L., & Lin, Y. C. (2016). Effects of storytelling to facilitate EFL speaking using web-based multimedia system. *Computer Assisted Language Learning, 29*(2), 215–241.

Kim, S. H. (2014). Developing autonomous learning for oral proficiency using digital storytelling. *Language Learning & Technology, 18*(2), 20–35.

Lord, G. (2008). Podcasting communities and second language pronunciation. *Foreign Language Annals, 41*(2), 364–379.

Lu, F., Tian, F., Jiang, Y., Cao, X., Luo, W., Li, G., Zhang, X., Dai, G., & Wang, H. (2011). ShadowStory: Creative and collaborative digital storytelling inspired by cultural heritage. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1919–1928). ACM.

Nordmark, S., & Milrad, M. (2012). Mobile digital storytelling for promoting creative collaborative learning. In *2012 IEEE Seventh International Conference on Wireless, Mobile and Ubiquitous Technology in Education* (pp. 9–16). IEEE.

Papert, S., & Harel, I. (1991). Situating constructionism. In I. Harel & S. Papert (Eds.), *Constructionism* (pp. 1–11). Ablex Publishing.

Razmi, M., Pourali, S., & Nozad, S., (2014). Digital storytelling in EFL classroom (Oral presentation of the story): A pathway to improve oral production. *Procedia – Social and Behavioral Sciences, 98*, 1541–1544.

Robin, B. (2006). The educational uses of digital storytelling. In C. Crawford, R. Carlsen, K. McFerrin, J. Price, R. Weber, & D. Willis (Eds.), *Proceedings of SITE 2006 – Society for Information Technology & Teacher Education International Conference* (pp. 709–716). Association for the Advancement of Computing in Education (AACE).

Robin, B. (2016). The power of digital storytelling to support teaching and learning. *Digital Education Review,* (30), 17–29.

Rubino, I., Barberis, C., & Malnati, G. (2018). Exploring the values of writing collaboratively through a digital storytelling platform: a mixed-methods analysis of users' participation, perspectives and practices. *Interactive Learning Environments, 26*(7), 882–894.

Smeda, N., Dakich, E., & Sharda, N. (2014). The effectiveness of digital storytelling in the classrooms: A comprehensive study. *Smart Learning Environments, 1*(1), 6.

Verdugo, D. R., & Belmonte, I. A. (2007). Using digital stories to improve listening comprehension with Spanish young learners of English. *Language Learning & Technology, 11*(1), 87–101.

Xu, Y., Park, H., & Baek, Y. (2011). A new approach toward digital storytelling: An activity focused on writing self-efficacy in a virtual learning Environment. *Educational Technology & Society, 14*(4), 181–191.

Yang, Y. T. C., & Wu, W. C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education, 59*(2), 339–352.

Yuksel, P., Robin, B., & McNeil, S. (2011). Educational uses of digital storytelling all around the world. In M. Koehler & P. Mishra (Eds.), *Proceedings of SITE 2011 – Society for Information Technology & Teacher Education International Conference* (pp. 1264–1271). Association for the Advancement of Computing in Education (AACE).

Author's Information:

Bradley Irwin earned his MEd in Second Language Education from OISE at the University of Toronto. He has written extensively about corrective and formative feedback practices and innovative approaches to technology use in language learning. His research interests include language learner identity, autonomous learning, CALL, and MALL.

Email: **irwin.bradley@nihon-u.ac.jp**

5

Feasibility of Learning a Language Using a Full Online Course

Masumi Kai, University of Guam

Abstract

Online education is attracting many educators and learners. Nevertheless, there is still a skepticism regarding a full online education, especially at the beginner's level of language learning. There is a persistent argument that online language instruction is not as effective as face-to-face instruction to teach a language. This paper investigates whether an online language course is in fact as effective as the traditional classroom learning to learn a new language. The online learning students' outcomes are compared to the students in the traditional classroom setting. Students' motivations and expectations for taking an online language course are also analyzed. Then the paper further analyzes correlation between students' outcomes and the reasons of taking an online course, and expectations. The data we use are questionnaires and test results collected from 208 participants (134 from online course and 74 from in-class course) between 2009 and 2019. Our data show that many students take an online course due to their busy schedule, not because they think an online course is easier. Online learning students' outcomes are not in the least inferior to the traditional in-class learning students in exam scores. From our results, we claim that success or failure of online language learning is not necessarily an attribute of online instruction itself.

現在オンライン教育は多くの教育者や学習者から注目を浴びている。それにも関わらず、完全なオンライン教育の中でも、特に初級レベルの学習者を対象としたオンラインでの言語教育に対しては懐疑的な意見もある。オンラインでの言語教育は従来の対面での教室教育ほど効果的ではないというのが根強い意見である。そこで本稿では、新しい言語を学習するのに、伝統的な教室学習と比べてオンライン言語学習コースが有効であるのかを考察する。分析データは、2009年から2019年までの間に得られたアンケート結果とテスト結果で、サンプル数は208（134人のオンラインコース学習者と74人の教室学習者）である。分析手法としては、オンライン学習者の到達度と教室学習者の到達度との比較、またオンライン学習者については、オンラインコースを選択する動機とオンラインコースに対する期待を調べる。そして、オンラインコースを取る理由、オンラインコースに対する期待に関して、学習者の到達度とどのような相関関係があるかについても分析する。本稿のデータ分析から、学習者がオンラインコースを選択する理由の多くは、オンラインコースが簡単だと思うからではなく、スケジュールの都合によること、オンライン学習者の到達度は、教室学習者の到達度と比べて劣っていないという結果が得られた。またこれらの結果は、オンラインでの言語学習の成否はオンライン教育自体にあるのではないということを示唆する。

Keywords: **Online course, Moodle, Zoom, motivation, the Japanese language course**

In the past few decades, a variety of learning formats have become available as alternatives to traditional classroom learning. The examples include e-learning, distance learning, blended learning, digital learning, virtual learning, and the like. In short, *online learning* offers students learning experience by using an Internet connection. e-Learning connects the students and teacher through an Internet connection only without physical contacts in an actual classroom. The term *distance learning* is used to attract the students globally, and it is also understood as a synonym of online learning. *Blended learning* is a combination of the traditional learning of face-to-face instruction of the teacher in a classroom with online instructions of a remote teacher through a video conference tool. *Digital*

learning includes a combination of e-learning and blended learning along with offline digital learning. *Virtual learning* allows the students to interact, connect, learn and share their learning materials with the other students and teachers outside of their classroom by using a video conferencing software. In this paper, the term *online learning* includes all these formats referring to a delivery mode using an Internet connection, either partially or fully, asynchronous or synchronous.

Online education advocates claim that online learning can provide student-centered and technology-enhanced instruction (e.g., Knowlton, 2000). Online learning could meet the needs of modern students whose life style and learning style have been rapidly changing. Online education has been expanding. About fifteen years ago, Allen and Seaman (2003, p. 15) reported that over 1.6 million students took at least one online course during Fall 2002 and over one-third of these students (578,000) took all of their courses online in the US. The US Department of Education's National Center for Education Statistics analyzes the movements of students who take online courses in the US. It continues to grow, even though overall college enrollments are flat or falling. Figure 1 illustrates the changes of the number of students who enrolled in distance education between 2012 and 2017. The data was collected under the National Center for Education Statistics.

Figure 1

Students Enrolled in Distance Education Courses
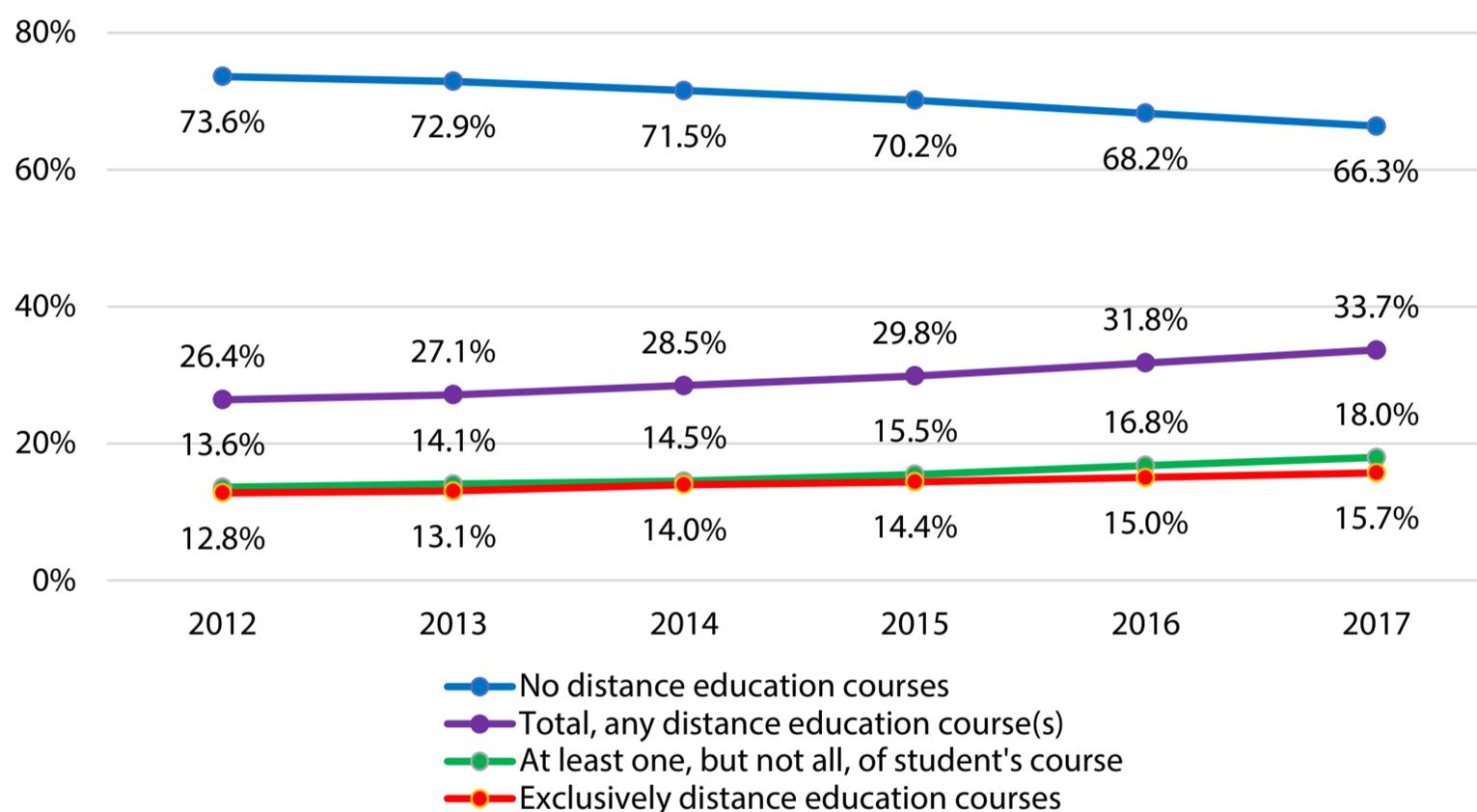
Their data shows that the percentage of students who do not enroll in any distance courses keeps declining. In 2017, such students surged to about 66.3%. On the other hand, students who enrolled in any distance course have been increasing, and they made up about one-third of the students in 2017. There are even students who enrolled exclusively in distance courses. The percentage was 12.8% in 2012, and it became 15.7% in 2017. As this data shows, it is a fact that the number of online learning students is undeniably increasing.

For the present, most universities in the US offer some online courses. According to Allen and Seaman (2003), 81% of all institutions of higher education in the US offered at least one fully online or blended course. Among public institutions, the numbers were more compelling, with 97% offering at least one online or blended course and 49% offering an online degree program in 2002–2003. Yet, not all educators are wholeheartedly in favor of online education. There are also conservative arguments

in online learning discussions (e.g., Heppen et al., 2017; Bettinger et al., 2017). Fully online and semester-length language courses for the beginning level learners can be a cause for concern by some foreign language teachers. Many educators are still incredulous of online language learning. Their persistent argument is that online language instruction is not as effective as face-to-face instruction (e.g., Beck, 2014; Jabeen & Thomas, 2015; Kuama & Intharaksa, 2016). In particular, fully online Japanese language courses for the beginning level learners are not yet prevalent and not widely accepted in Japan. Is this allelomorphism based on abundant evidence, or is it merely the matter of educator's ideology?

This paper will compare a semester-length, online language course with a traditional, face-to-face language course taught by the same instructor and discuss the following research questions:

1. Why do students choose an online course when there is a choice?
2. What do students expect from an online education?
3. Is there any correlation between students' motivations and their outcomes?
4. Is there any correlation between students' expectations towards an online course and their outcomes?
5. Is online language learning as effective as traditional in-class learning?
6. What are the factors that determine success in online learning?

Literature Review

Online learning has been attracting a greater number of educators and learners. Coinciding with this trend, many discussions are being held regarding the benefits, efficacy, or pitfalls and challenges of online learning (e.g., Beaudoin et al., 2009; Librenjak et al., 2016; Hills, 2016; Suresh et al., 2018; Pei & Wu, 2019; Dutton et al., 2019). The relationship between learners' motivations and online education are also being discussed (e.g., Stevens, 1991; Brett, 1996; Coates, 2006; Alkış & Temizel, 2018). The online educator's role and learning environment are important topics as well (Kochtanek & Hein, 2000; Smith et al., 2002; Bonk et al., 2001; Nemetz et al., 2017).

Comparison between an online course and a face-to-face course is a popular topic in examining the effectiveness of online education. Proponents of postsecondary online education either have often found no significant differences between outcomes in online and face-to-face courses (e.g., Johnson et al., 2000; Thirunarayanan & Perez-Prado, 2001; Neuhauser, 2002; Lou et al., 2006; Jahng et al., 2007; Means et al., 2009), or students' performances or outcomes in online courses are superior to those in traditional face-to-face courses (e.g., Dobrin, 1999; Maki et al., 2000; Shea et al., 2001). However, there are also studies gainsaying these findings. For example, Jaggars and Bailey (2010, p. 3) rebutted that propitious findings about online courses does not hold for the studies that pertain to fully online, semester-length college courses. Also, these studies consider courses that were taken by relatively well-prepared university students and do not present evidence among low-income and academically underprepared students (p. 10).

The studies investigating students' reasons to enroll in fully online courses are sparse, but there are some. Cheslock et al. (2018, p. 37) mentioned that their students selectively enroll in online courses because online courses can help students navigate timing challenges associated with work or caregiving, complete courses for which no face-to-face enrollment slots are open, and enroll in summer coursework while living far from campus. Hannay and Newvine (2006) found that most of their students enrolled in an online criminal justice course opted for online course due to the time commitments, such as work and family. O'Neill and Sai (2014) investigated the opposite case: why students avoid an online course and chose to attend the traditional type course. They surveyed 48 students in a face-to-face introductory educational psychology course. A majority of respondents suggested that students believed that they would learn better face-to-face. O'Malley and McCraw (1999) surveyed business students in online courses. Their students reported that online courses saved time and were more convenient for their schedules. Stewart et al. (2004) showed that 81% of their students in an

online marketing course agreed that the flexibility of online course aided their learning of the course contents. Grimes (2002) interviewed 13 students enrolled in a dental terminology course. Students claimed that they could learn a great deal in the course at their own pace and at times that fit their family and work schedule. Regarding the type of online learning activities, Simonds and Brock (2017) analyzed that older students indicated a much stronger preference for videos of the professor lecturing, while younger students tended to prefer more interactive learning strategies.

There are numerous numbers of studies discussing about the online learning as seen above, however, as far as the author knows, the online language learning except English has not been examined enough. This paper will focus on the language learning online and discuss the research questions presented above.

Methods

Participants

The participants in this study are two sets of students at the author's institution who took the beginning level Japanese language course between 2009 and 2019. One set is those who took an online Japanese language course and another set is those who took an in-class Japanese language course. Both sets of students were taught by the same instructor, using the same textbook and teaching materials. The author's institution is a four-year university with two colleges and four schools. Most students take this course for their general education credits. Participants' grade levels in this study were from freshman to senior. Their ages ranged from 18 to 30s.

Data

The data used in this paper are (1) survey results from a questionnaire answered by online course students, (2) the final grades from online course students, and (3) the final written test results from online course students and in-class course students. The questionnaires were obtained from 113 online students, and test results were collected from 208 students (134 from online course and 74 from in-class course).

The questionnaire was composed of multiple-choice questions regarding: the reason for taking the online course instead of a face-to-face course; expectation from the online course; speculations of the achievement at the end of the semester compared to a face-to-face course; previous learning experience of the Japanese language and its period; other language(s) the students speak; intention of minoring the Japanese language in the future. These questions were selected by the author to understand the characteristics of the students who take the online course. The questionnaires were answered by students online during the first week of the semester. Outcomes from online course students and in-class course students are measured by a written test. The written test was given at the end of the semester as their final exam. We also use the online students' final grades to examine the correlation with our research questions. The final grades are assigned a letter grade: A, B, C, D, and F (A >90, B: 89–80, C: 79–70, D: 69–60, F <60). The grade is determined by a combination of the following items:
- Quiz results
- Written homework submission
- Participation in oral practice with a partner, and with the teacher
- Midterm and the Final written test results

Background

The author has been offering a full online Japanese language course to beginning-level students since 2015. Currently, the Japanese language program at the author's institution offers traditional in-class courses and fully online courses. Students can choose either course. The courses share the same learning objectives, and students are expected to achieve at the same academic level by the end of the course. The goal for Elementary Japanese I is to be able to write basic Japanese characters (hiragana and katakana, and about 60 kanji), and to learn the basic grammar needed to make a simple sentence.

Online Course Contents

The platform for our online Japanese language course is Moodle. In this course, students have mandatory activities from Monday to Thursday. The online course contents are designed to be equivalent to an in-class Japanese language course. In an in-class Japanese language course, students learn Japanese for 50 minutes from Monday through Thursday.

In the online Japanese language course, students watch lecture videos, and then answer Moodle quizzes every day. Each video explains one grammar and it lasts between 3 minutes to 8 minutes. Students are assigned to watch one to two videos in a day. It is not long, however, it covers the equal amount of characters and grammars that are taught in the author's face-to-face class in a day. In online course, the instructor can save time of waiting for students to be situated, taking attendance, writing grammars on the white board, etc. After watching the video(s) of the day, students need to take Moodle quizzes that correspond to the lecture videos. Moodle quizzes are not time controlled. Some advanced students spend less than 5 minutes and some students spend more than 30 minutes to answer quizzes. In a face-to-face course, the instructors do not give quizzes every day. There is written homework such as character (*kanji*) writing and dialogue. The same written homework is given in the author's face-to-face course. In online course, students practice conversations with a partner and with the instructor, using video-conferencing software called Zoom. The conversation practice with a partner on Zoom is held twice a week, and practice with the instructor is on specified days. Students practice conversation using task sheets, and the practice must last at least 20 minutes each time. Many groups finish practicing task sheets in 20 minutes, but some groups practice longer: from 30 minutes to 1 hour. Their practices are automatically recorded, and the instructor can check their practices later. Students are also matched up with Japanese college students and practice conversations once a week. Japanese students voluntarily participate this project. There is no such cooperative project with Japanese students in face-to-face courses. Students take the Midterm and the Final, both of which are written tests. The same written tests are used in the author's face-to-face courses. In online course, the written exams are conducted at the university online center, and students sign up for their preferred time. There are also oral performance tests. The same topics and evaluation tools are used both in the online course and the author's face-to-face course. In online course, oral performance tests are conducted with the instructor using Zoom videoconferencing software.

Discussion

Reason for Taking an Online Course

The first research question is, why do students take an online course, especially when they have the option to take a traditional face-to-face course?

Some students hesitate to take an online language course, especially if they have never taken an online course before (e.g., Dobbs et al., 2017). However, in our case, online language courses reach full enrollment faster than face-to-face courses every semester. Why do some students choose to take

an online course? Figure 2 shows students' reasons for taking an online course. Multiple answers were allowed to this question.

Figure 2

    Reason for Taking an Online Course
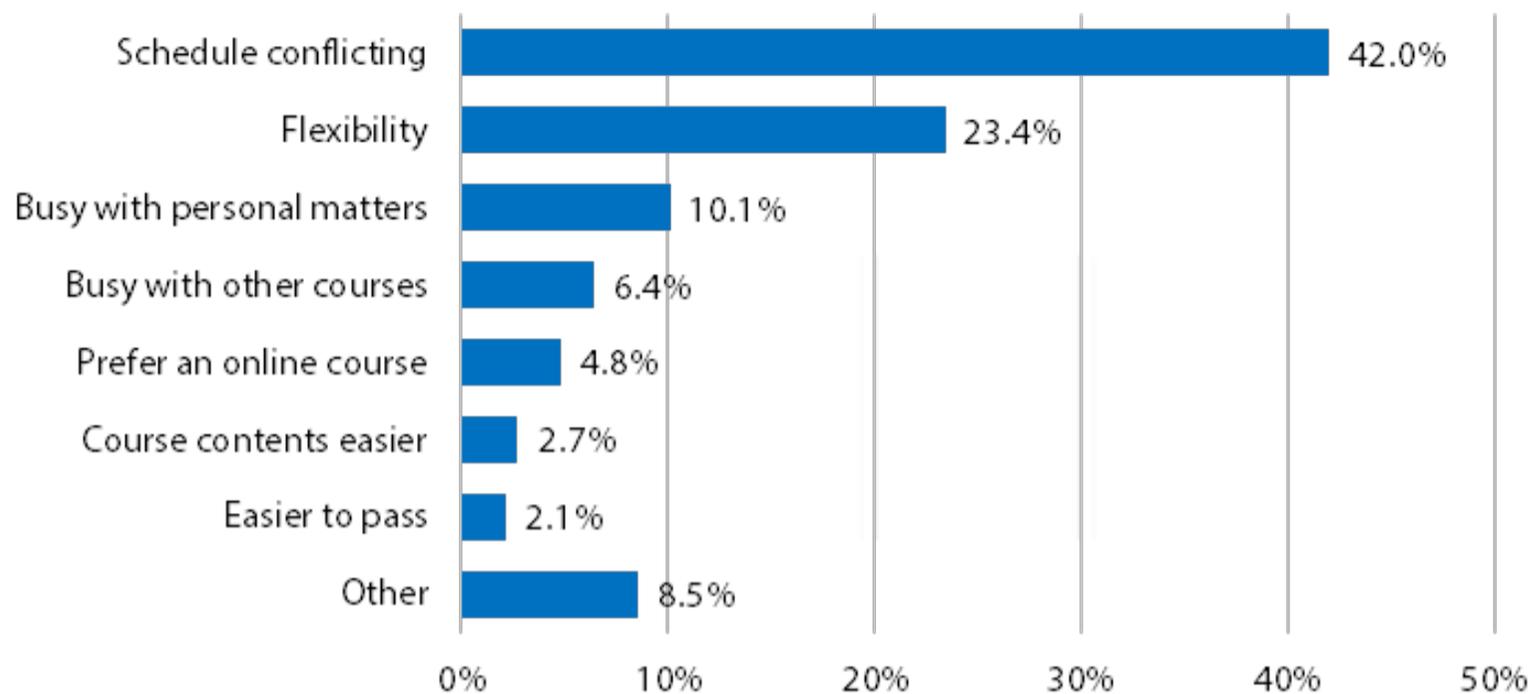
As the results show, the major reason for taking an online course is due to the student's schedule. Their schedule conflicts with the face-to-face course time. This reason accounts for 42.0%. The second most common reason is that students prefer flexibility. Students like the idea of not being tied down to a daily course schedule. This reason accounts for 23.4%.

The studies from O'Malley and McCraw (1999), Grimes (2002), and Stewart et al., (2004) presented that students' positive feedback towards online courses. These reports are from students who completed the online courses. Our study's data indicates that students enrolled in an online course due to the same reason. If students enroll in an online course because of their busy schedule, and an online course offers flexibility of learning without lowering the quality of education, then online learning would be the ideal choice for students. But many educators are concerned about online course students' achievements.

Correlations between the Reasons of Taking an Online Course and the Students' Outcomes

Educators who do not teach any online courses may think that students take an online course because an online course is easy to pass, and accordingly students' outcomes would be lower. In order to examine this argument, we analyze if there is any correlation between students' reasons for taking an online course and their outcomes.

Previously, Figure 2 indicated that the top two reasons for taking an online Japanese language course rather than an in-class course are schedule conflicts and flexibility. Figure 3 shows the top two reasons for taking an online course by the students' final grade groups, A, B, C, D, and F.

Figure 3

The Two Most Popular Reasons for Taking an Online Course by Grade Groups
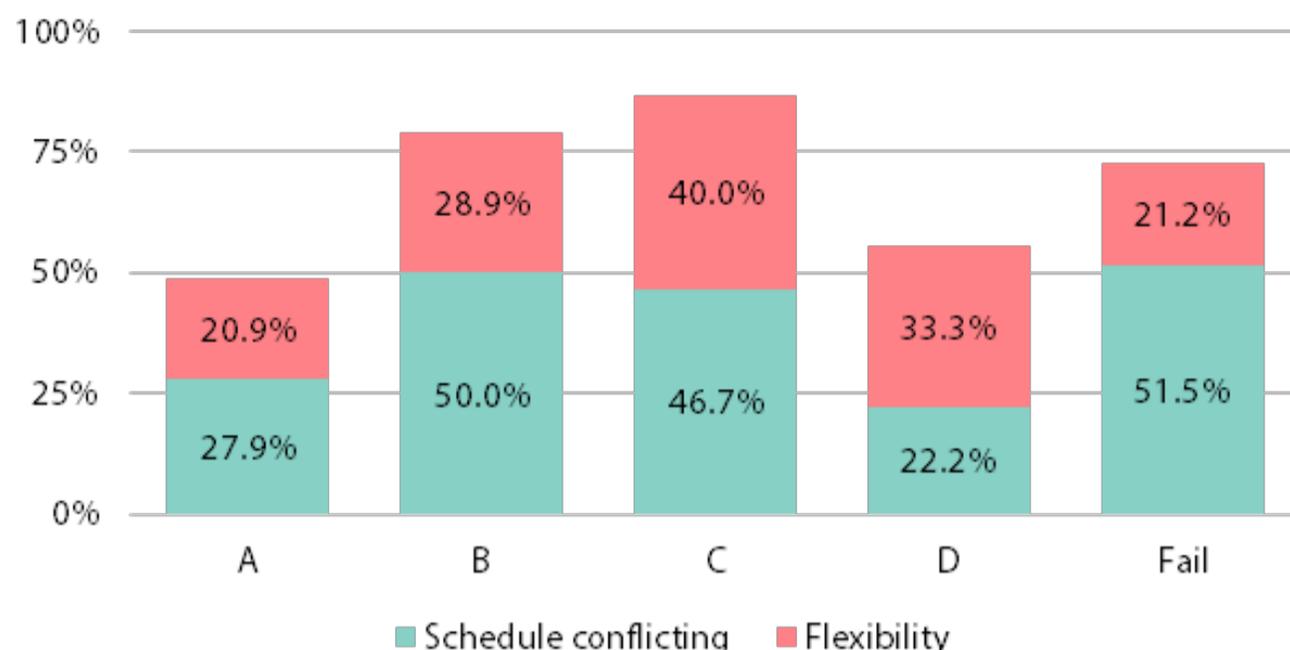
A correlation coefficient analysis using χ^2-test in SPSS was performed to investigate whether there are correlations between students' final grades and their reasons for taking an online course. The results found significance by groups ($p < 0.01$***).

For the A, B, and C-grade groups, the most popular reason is due to scheduling conflicts. A high proportion of the A-grade group also chose the answer *busy with other courses* and *busy with personal matters*. The B, C, D-grade groups chose flexibility in higher proportions, compared to the A-grade group. Our questionnaire result showed that some students take an online course based on a fallacy: an online course is easy. However, no correlation was found between the students' final grades and such reason ($p > .05$). That is, even if students chose to take an online course because they thought it is easier, they did not necessarily get a lower grade.

Students' Expectation from an Online Course

In the author's institution, online Japanese language courses reach full enrollment faster than face-to-face courses every semester. It makes some educators to think that students expect an online course to be easier to pass. Although not many studies have been done on students' expectations from an online course, Papillion and Aaron (2017) evaluated 38 students' perceptions of an online radiologic science course. Their results demonstrated that respondents perceived that the following course characteristics are most important for effective online radiologic science courses: a well-organized course; timely instructor feedback; documents such as course syllabus, calendar; rubrics, and a variety of learning activities. Mupinga et al. (2006) collected data from 131 undergraduate students enrolled in three web-based sections and introduced that the top three expectations of the online students were communication with the professor, instructor feedback, and challenging online courses.

Our study asked the participants about their perception of the online course. Multiple answers were allowed to this question. Figure 4 shows the results of what students expect from on an online course.

Figure 4

Expectation from an Online Course
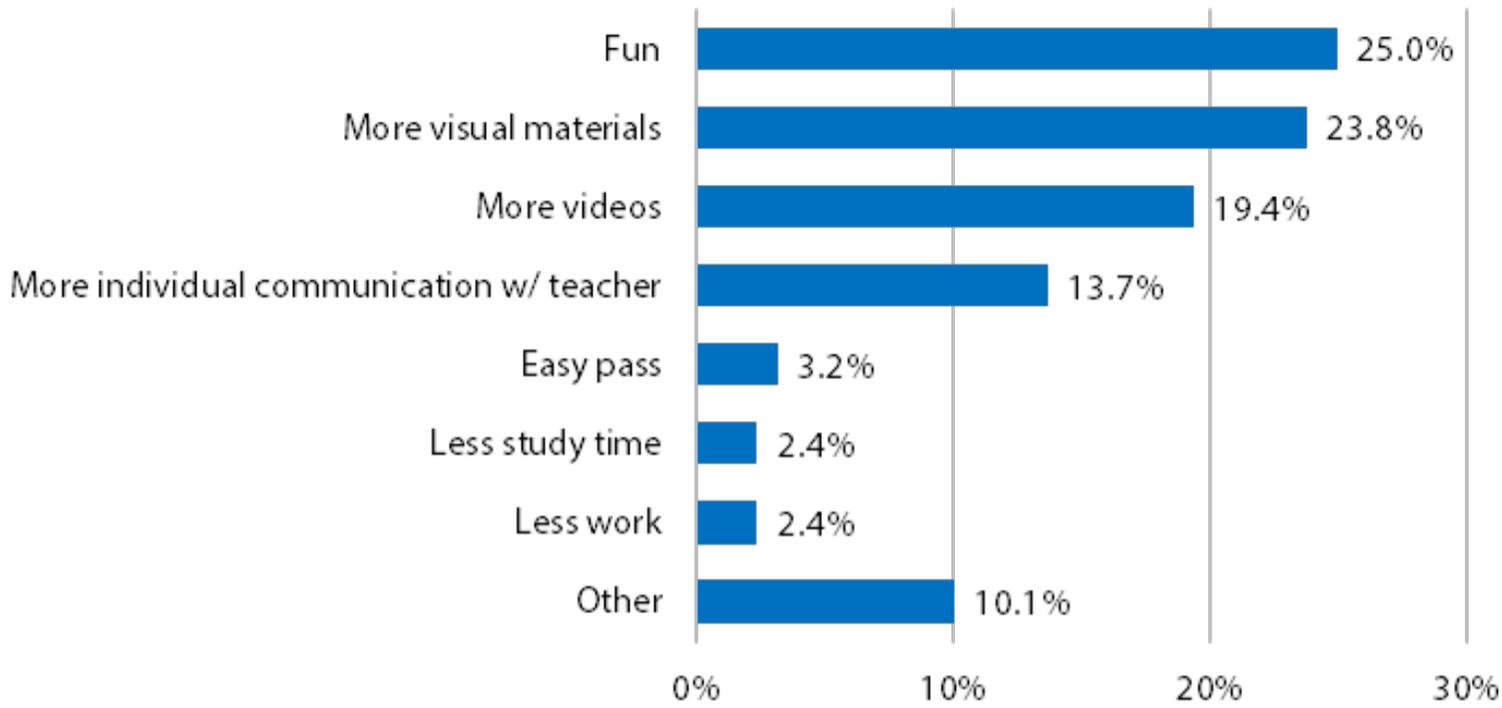
The results show that only 3.2 % chose *easy pass*. The most popular answer was *fun* with 25% of the vote. The second and the third expectations were *more visual materials* and *more videos* respectively. Mupinga et al. (2006) pointed their students' preference to communicate with the instructor. In the author's study's data, *more communication with the instructor* also got a relatively high response percentage.

Correlations between Expectations and the Outcomes

We now examine students' expectations by their final grade groups. Figure 5 shows the top three expectations from an online course by students' final grade groups.

Figure 5

The Top 3 Expectations from an Online Course by Grade Group
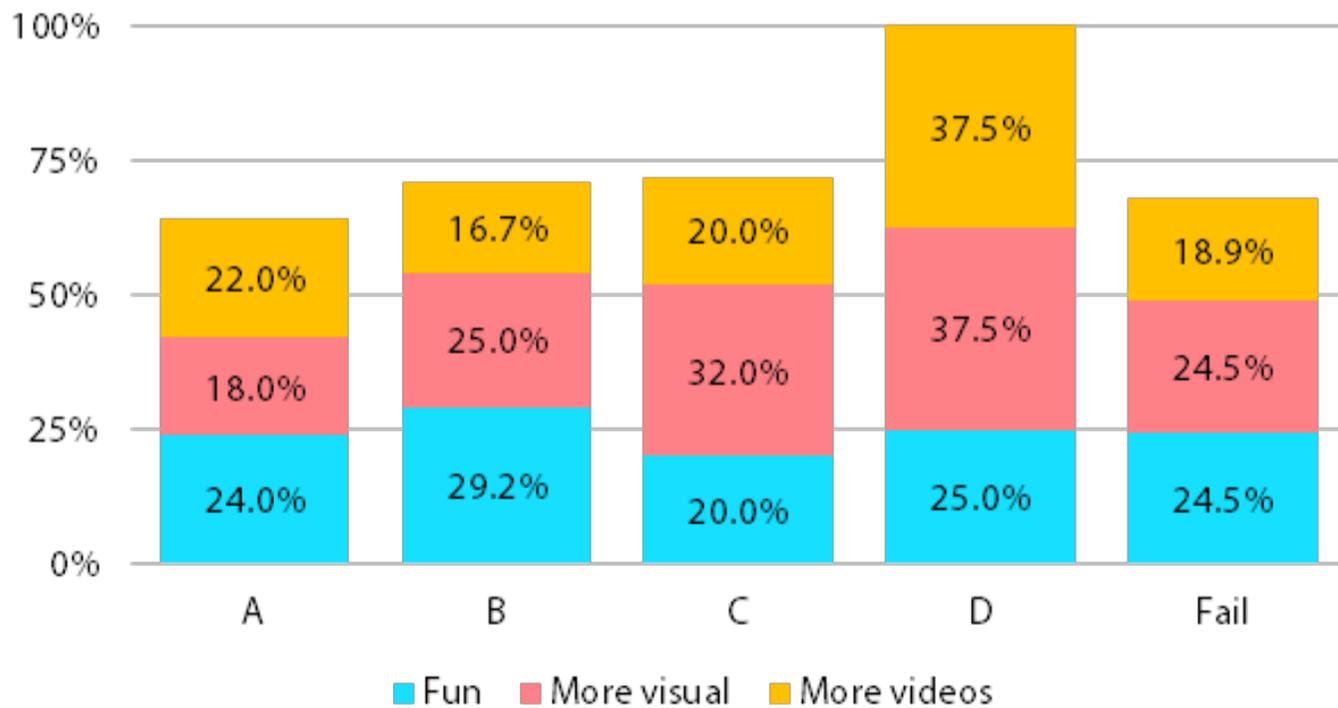
A correlation coefficient analysis was performed to investigate whether there was correlation between students' expectations and their final grades. The results found significance by groups ($p < 0.01***$). *Fun* was the most popular expectation for the A and B-grade groups. *More visual materials* was the most popular choice for the C, D, and F-grade students. The top three answers account for more than 50% for all grade groups. The top three answers account for 100% for the D-grade students. This result indicated that many students expect the online course to be fun. Lower grade students tend to prefer visual materials more than A-grade students.

Is Online Language Learning Not As Effective As Traditional Learning?

As shown in the literature review, there has been a long-term discussion whether or not online learning is as effective as traditional learning. There are many studies supporting the online education. However, Jaggars and Bailey (2010) claim that propitious findings does not hold for the studies that pertain to fully online, semester-length college courses, and the participants in their studies were relatively well-prepared university students.

We can claim that this study's data provides a good case for study. First, the course is a fully online, semester-length college course. Also, not all of the participants are well-prepared university students. Most students had a job. Some students had small children, and some of them were single parents. Our institution is an open enrollment university. There are students who demonstrate academic insufficiency and struggle with learning postsecondary subjects.

Figure 6 compares the final exam results between online course students and in-class learning students between 2009 and 2019.

Figure 6
Final Test Results
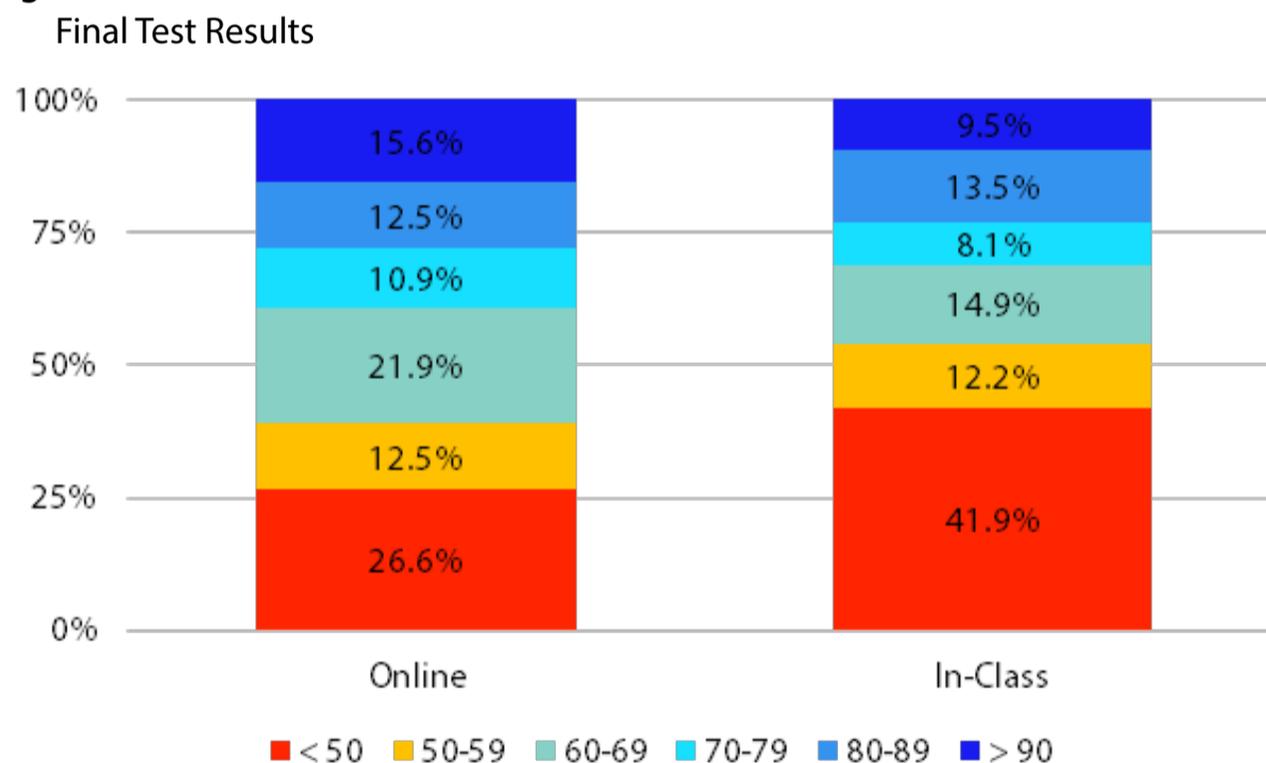
The same written test has been used for both the online course and the in-class course. Figure 6 shows that more in-class students got lower than 50 points on the test (41.9%) compared to online course students (26.6%). Besides, more online course students got higher than 90 points (15.6%), compared to in-class students (9.5%). Dobbs et al. (2017) reported that students who had taken an online course disagreed that the quality of online courses was lower than traditional courses, while those who had not taken an online course agree with this item. Further those who had taken five or more online courses more strongly disagreed with this item than did those who had taken one or two to four online courses. Similarly, this study's results suggest that some skeptics concerns that an online course is not

as effective as an in-class course (e.g., Beck, 2014; Jabeen & Thomas, 2015; Kuama & Intharaksa, 2016) is not always the case. Success or failure of online language learning is not necessarily attributable to online instruction itself.

The Factors That Determine Success In Online Learning

The previous sections demonstrated that the online language learning does not necessary cause the poor outcomes. Our data showed that the outcomes of the online learners and the in-class learners did not have significant differences. It suggests that online learning is not as direful as skeptics believe. Online education provides an alternative opportunity for busy learners and it could be a better choice for such learners. Then, what is the problem with the online education?

There are many discussions about key factors for success in online learning such as motivation, technical environment, age, etc. As previous research pointed out, there are types of students who can be more successful in online learning and others who may fail more easily in an online setting. Many researchers have claimed that the learners themselves are one of the key factors in online learning success (Boyd, 2004; Sun, 2014; Cho & Jonassen, 2009; Cho et al., 2010). Brent and Bugbee (1993), and Palloff and Pratt (1999) discussed the characteristics of the students in detail. They described the most successful online learning student as one who is voluntarily seeking further education; highly motivated and self-disciplined; older; willing to initiate calls to instructors for assistance; possessing a more serious attitude toward coursework; and already a holder of a college degree. Sun (2014) used qualitative and quantitative data and claimed that self-motivation, self-directed learning, and self-regulation of learning are the key factors in predicting online learning success. Students need to possess autonomy, self-motivation, self-discipline, integrity, as well as an independent learning style. Hodges (2008), Cho and Jonassen (2009), Cho et al. (2010) claimed that learner self-efficacy is critical in online learning, and can be a key factor in this challenging learning environment. Hurd (2006), Guichon (2009), and Wang (2010) stated that the factor of self-regulation of learning includes skills such as setting goals, orienting action accordingly, planning, monitoring, asking for help when needed, trying out different strategies, and reflecting. Womble (2008) found a significant correlation between e-learning self-efficacy and e-learner satisfaction. In addition, Lim (2001) stated that computer self-efficacy was a significant predictor of online learners' satisfaction and their intention to take future online courses. Boyd (2004) reviewed previous research and included technical issues as one of the factors for successful online learning. He pointed out four sets of factors: the technical factors, which concern the students' accessibility and technical skills to participate in an online course; the students' individual environmental factors such as their time and space; the personal factors; that are students' characteristics; and various learning characteristics that successful online students exhibit and possess.

In view of this previous research, we summarize the three main factors for successful online learning:
1. Students' intrinsic factors: self-discipline, integrity, learner self-efficacy, motivation, and autonomy;
2. Students' learning factors: self-directed learning, independent learning style, self-regulation of learning, learning initiative, time, and space;
3. Technical factors: Internet connection and speed, Internet tools, and computer literacy.

The first factor is important both for online learning and in-class learning. Students who are successful in the traditional in-class environment also need possess characteristics listed above in (1) students' intrinsic factors. The second and the third are the crucial factors to be successful in online learning.

Conclusion

Online education is expanding. However, there are still some skeptical ideas on online language learning (e.g., Beck, 2014; Jabeen & Thomas, 2015; Kuama & Intharaksa, 2016). The purpose of this paper was to examine these arguments' credibility using data collected from surveys, the final written exam results, and final grades of students studying Japanese in either online or in-class courses. The paper discussed six research questions: 1) reasons for students to choose an online course, 2) students' expectations from an online education, 3) correlation between students' motivations and their outcomes, 4) students' expectations towards online course and their outcomes, 5) effectiveness of an online language learning compared to traditional in-class learning, and 6) factors that determine success in online learning.

Our data shows that most popular reason for students to take an online course instead of a traditional face-to-face was due to schedule conflicting or their busy schedule. Interestingly, students with higher grades showed a tendency to have this reason to choose an online course. As some skeptics may presume, it is not because students think an online course is easy to pass.

Regarding the students' expectation from an online course, the most popular answer was *fun* with 25% of the vote. The second and the third expectations were *more visual materials* and *more videos* respectively. *More communication with the instructor* also got a relatively high percentage of responses. This result is aligned with Mupinga et al.'s (2006) findings. Correlation analysis indicates that students with lower final grades tended to prefer visual materials more than A-grade students. In classroom instruction, there is a limitation for an instructor to prepare a variety of visual materials for each class. In contrast, online education can be a positive instruction tool to provide more visual materials to students.

The effectiveness of online language learning compared to traditional in-class learning is one of the biggest concerns for educators. Our results showed that more in-class students got lower scores than online course students, and more online course students got higher scores on the final test compared to in-class students. Our results suggested that the skeptical idea that an online course may not as effective as an in-class course is not always the case. We claim that online education itself does not especially lower students' achievements. Success or failure of online language learning is not necessarily attributable to online instruction itself. However, there are some factors that determine success in online learning. In online education, a teacher's involvement and communication with learners is more essential.

There are some issues that were not discussed in this paper. One of the biggest challenges in learning non-alphabetic languages is orthography. For example, learning stroke orders is very important, especially in Japanese or in Chinese. Investigating the students' character learning process and outcomes will be a future research topic. Another issue is instructor's feedbacks. In an online language course, students cannot get immediate feedbacks from the teacher. Their oral mistakes are not corrected immediately, like in a face-to-face class. Does this unsynchronization affect to students' oral proficiency level at the end of the course? This issue also needs to be further discussed.

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References

Alkış, N., & Temizel, T. T. (2018). The impact of motivation and personality on academic performance in online and blended learning environments. *Journal of Educational Technology & Society, 21*(3), 35–47.

Allen, E., & Seaman, J. (2003). *Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003*. The Sloan Consortium.

Beaudoin, M., Kurtz, G., & Eden, S. (2009). Experiences and opinions of e-learners: What works, what are the challenges, and what competencies ensure successful online learning. *Interdisciplinary Journal of E-Learning and Learning Objects, 5*, 275–289.

Beck, J. (2014, February 7). Why learning a language online is a terrible idea. *Go Overseas*. **https://www.gooverseas.com/blog/why-you-shouldnt-learn-a-language-online**

Bettinger, E. P., Fox, L., Loeb, S., & Taylor, E. S. (2017). Virtual classrooms: How online college courses affect student success. *American Economic Review, 107*(9), 2855–2875.

Boyd, D. (2004). The characteristics of successful online learners. *New Horizons in Adult Education and Human Resource Development, 18*(2), 31–39.

Bonk, J. C., Kirkley, J., Hara, N., & Dennen, P. V. (2001). Finding the instructor in post-secondary online learning: Pedagogical, social, managerial, and technological location. In J. Stephenson (Ed.), *Teaching & learning online: Pedagogies for new technologies* (pp. 76–97). Routledge.

Brent, F. L., & Bugbee, A. C. (1993). Study practices and attitudes related to academic success in a distance learning program. *Distance Education, 14*(1), 97–112.

Brett, P. (1996). Using multimedia: An investigation of learners' attitudes. *Computer Assisted Language Learning, 9*(2-3), 191–212.

Cheslock, J. J., Ford, K., Zhang, L., & Dillon, J. M. (2018). Online course taking behavior for on-campus college students. *The Quarterly Review of Distance Education, 19*(4), 37–50.

Cho, M-H., & Jonassen, D. (2009). Development of the human interaction dimension of the self-regulated learning questionnaire in asynchronous online learning environments. *Educational Psychology, 29*(1), 117–138.

Cho, M-H., Shen, D., & Laffey, J. (2010). The role of metacognitive self-regulation (MSR) on social presence and sense of community in online learning environments. *Journal of Interactive Learning Research, 21*(3), 297–316.

Coates, H. (2006). *Student engagement in campus-based and online education.* Routledge.

Dobbs, R. R., Waid-Lindberg, C. A., & del Carmen, A. (2017). Students' perceptions of online courses – The effect of online course experience. *The Quarterly Review of Distance Education, 18*(1), 93–109.

Dobrin, J. (1999). Who's teaching online? *ITPE News, 2*(12), 6–7.

Dutton, Y. M., Ryznar, M., & Long, K. (2019). Assessing online learning in law schools: Students say online classes deliver. *Denver Law Review, 96*(3). 493–534.

Grimes, E. B. (2002). Use of distance education in dental hygiene programs. *Journal of Dental Education, 66*(10), 1136–1145.

Guichon, N. (2009). Training future language teachers to develop online tutors' competence through reflective analysis. *ReCALL, 21*(2), 166–185.

Hannay, M., & Newvine, T. (2006). Perceptions of distance learning: A comparison of online and traditional learning. *MERLOT Journal of Online Learning and Teaching, 2*(1), 1–11.

Heppen, J. B., Sorensen, N., Allensworth, E., Walters, K., Rickles, J., Taylor, S. S., & Michelman, V. (2017). The struggle to pass algebra: Online vs. face-to-face credit recovery for at-risk urban students. *Journal of Research on Educational Effectiveness, 10*(2), 272–296.

Hills, H. (2016). *Individual preferences in e-learning*. Routledge.

Hodges, C. B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly, 20*(3–4), 7–25.

Hurd, S. (2006). Towards a better understanding of the dynamic role of the distance language learner: Learner perceptions of personality, motivation, roles, and approaches. *Distance Education, 27*(3), 303–329.

Jabeen, S. S., & Thomas, A. J. (2015). Effectiveness of online language learning. In *Proceedings of the World Congress on Engineering and Computer Science,* I, (WCECS, 2015). San Francisco

Jaggars, S. S., & Bailey, T. (2010). Effectiveness of fully online courses for college students: Response to a Department of Education meta-analysis. *Online Education and Instructional Technology*. Community College Research Center, Columbia University. Retrieved from **https://ccrc.tc.columbia.edu/publications/effectiveness-fully-online-courses.html**

Jahng, N., Krug, D., & Zhang, Z. (2007). Student achievement in the online distance education compared to face-to-face education. *European Journal of Open, Distance and E-Learning, 2007*(I). **https://www.eurodl.org/index.php?p=archives&year=2007&halfyear=1&article=253**

Johnson, S. D., Aragon, S. R. Shaik, N., & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. *Journal of Interactive Learning Research, 11*(1), 29–49.

Knowlton, D. (2000). A theoretical framework for the online classroom: A defense and delineation of a student-centered pedagogy. *New Directions for Teaching & Learning, 84,* 5–14.

Kochtanek, T. R., & Hein, K. K. (2000). Creating and nurturing distributed asynchronous learning environments. *Online Information Review, 24*(4), 280–294.

Kuama, S., & Intharaksa, U. (2016). Is online learning suitable for all English language students? *PASAA, 52*, 53–82.

Librenjak, S., Kocijan, K., & Janjić, M. (2016). Improving students' language performance through consistent use of e-learning: An empirical study in Japanese, Korean, Hindi and Sanskrit. *Acta Linguistica Asiatica, 6*(2), 79–94.

Lim, C. K. (2001). Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *The American Journal of Distance Education, 15*(2), 41–50.

Lou, Y., Bernard, R. M., & Abrami, P. C. (2006). Media and pedagogy in undergraduate distance education: A theory-based meta-analysis of empirical literature. *Educational Technology Research and Development, 54*(2), 141–176.

Maki, R. H., Maki, W. S., Patterson, M., & Whittaker, P. D. (2000). Evaluation of a web-based introductory psychology course. *Behavior Research Methods, Instruments, & Computers, 32*, 230–239.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*. US Department of Education.

Mupinga, D. M., Nara, R. T., & Yaw, D. C. (2006). The learning styles, expectations, and needs of online students. *College Teaching, 54*(1), 185–189.

National Center for Education Statistics. (n.d.). **https://nces.ed.gov/programs/digest/index.asp**

Nemetz, P. L., Eager, W. M., & Limpaphayom, W. (2017). Comparative effectiveness and student choice for online and face-to-face classwork. *Journal of Education for Business, 92*(5). 210–219.

Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face instruction. *American Journal of Distance Education, 16*(2), 99–113.

O'Neill, D. K., & Sai, T. H. (2014). Why not? Examining college students' reasons for avoiding an online course. *Higher Education, 68*, 1–14.

O'Malley, J., & McCraw, H. (1999). Student perceptions of distance learning, online learning, and the traditional classroom. *Online Journal of Distance Learning Administration, 2*(4). **https://www.westga.edu/~distance/omalley24.html**

Palloff, R. M., & Pratt, K. P. (1999). Building learning communities in cyberspace: Effective strategies for the online classroom. Jossey-Bass.

Papillion, E., & Aaron, L. (2017). Student perceptions of online radiologic science courses. *Radiologic Technology, 88*(4), 336–372.

Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical Education Online, 24*(1), 1–5.

Shea, P., Fredericksen, E., Pickett, A. Pelz, W., & Swan, K. (2001). Measures of learning effectiveness in the SUNY learning network. In J. Bourne & J. Moore (Eds.), *Online Education: In Proceedings of the 2000 Sloan summer workshop on asynchronous learning networks, 3*. Sloan-C Press.

Simonds, T. A., & Brock, B. L. (2017). Relationship between age, experience, and student preference for types of learning activities in online courses. *Journal of Educators Online, 11*(1), 1–19. **https://doaj.org/article/05c021cf1d134b898f297716364f1fd2**

Smith, G. G., Ferguson, D., & Caris, M. (2002). Teaching over the web versus in the classroom: Differences in the instructor experience. *International Journal of Instructional Media, 29*(1), 61–67.

Stevens, V. (1991). A study of student attitudes toward CALL in a self-access student resource center. *System, 19*(3), 289–299.

Stewart, B. L., Waight, C. L., Norwood, M. N., & Ezell, S. D. (2004). Formative and summative evaluation of online courses. *The Quarterly Review of Distance Education, 5*(2), 101–109.

Sun, S. Y. H. (2014). Learner perspectives on fully online language learning. *Distance Education, 35*(1), 18–42.

Suresh, M., Vishnu Priya, V., Gayathri, R. (2018). Effect of elearing on academic performance of undergraduate students. *Drug Invention Today, 10*(9), 1797–1800.

Thirunarayanan, M. O., & Perez-Prado, A. (2001). Comparing web-based and classroom-based learning: A quantitative study. *Journal of Research on Technology in Education, 34*(2), 131–137.

Wang, M. J. (2010). Online collaboration and offline interaction between students using asynchronous tools in blended learning. *Australasian Journal of Educational Technology, 26*, 830–846.

Womble, J. (2008). E-learning: The relationship among learner satisfaction, self-efficacy, and usefulness. *The Business Review, 10*(1), 182–188.

Author's Information:

Masumi Kai is a full professor at the University of Guam. Dr. Kai received her PhD in Language and Culture from Osaka University of Foreign Studies. She was also a scholarship researcher at the UC, Santa Barbara and Harvard University. Her research fields are language acquisition & maintenance, and discourse analysis.

Email: **terrao3@hotmail.com**

6

CLIL and STEM English for Electrical and Electronic Engineers

Goh Kawai, Hokkaido University

Abstract

We report a case study of teaching practice of an EFL (English as a foreign language) course that used CLIL (content language integrated learning) for STEM (science technology engineering mathematics) intended for college freshmen in Japan having English language proficiency at the CEFR (Common European Framework of Reference) A2 or B1 levels. Our course targets EE (electrical and electronic) engineers. Engineers are professionals who possess knowledge of engineering theory and technology, plus knowledge of legal requirements and practical standards for applying that engineering knowledge. We chose part of the course material from USA amateur radio license examinations, which contain questions on electronic engineering and legal regulations. Amateur radio is within reach of many high school students and above. Learners seeking careers on the world stage may benefit from this entry-level learning experience to demonstrate the types of knowledge needed to become practicing engineers in society. Before studying in class, learners learned about amateur radio by listening to, speaking, reading, and writing material on an online learning system. During class, learners engaged in conversations that focused on phraseology and task completion.

日本語が母語であり、CEFR (外国語の学習・教授・評価 のためのヨーロッパ共通参照枠)A2ないしB1レベルのEFL (非母語としての英語)能力を有する大学1年生を対象としたSTEM (科学・技術・工学・数学)向けのCLIL (内容言語統合学習)の実践事例を報告する。本実践の主たる対象は電気電子工学をはじめ理工系科目を学ぶ学生である。一般に技術者とは技術の理論的知識を有し、かつその理論的知識を現実に用いるための法令と業界基準の知識を有する者をいう。電気電子工学の理論ならびに運用にかかる法令と基準の両方を含むとの理由でアメリカのアマチュア無線免許試験向けの教材を本実践に採用した。アマチュア無線免許を得るための知識は高校生の多くが理解しうる内容である。社会で活躍するエンジニアが有するさまざまな知識の種類を学ぶための入門レベルの学習体験を提供し、世界を舞台に働きたい学習者の資とする。本実践では、学習者が授業前にオンライン学習システムを通じてアマチュア無線のことがらについて聞き、話し、読み、書き、授業に備えた(予習が宿題)。授業中に用語産出やタスク完遂に焦点を当てた会話を実施した。

Keywords: CLIL, STEM, engineering English, technical English, collocations

We begin this report by stating the needs and motives of our learners, and the design requirements of our learning experiences. The remainder of this paper describes the materials and methods, followed by results and discussion. This article does not seek to validate a hypothesis, but rather describes teaching practice that practitioners may find useful.

At our university in Japan, the English language learners (ELLs) are freshmen having an English language proficiency at the CEFR (Common European Framework of Reference) A2 or B1 levels. Seventy-five percent of the 2,600 students major in technical fields. ELLs seeking careers in engineering are motivated to use practical language (such as technical terminology) and sources of technical information (such as technical data and engineering standards). The ELLs desire to take courses in English as a foreign language (EFL) that teach how to say phrases in technical contexts and to quickly find accurate information. To meet this need, and to allow the ELLs to socially succeed, we offer

courses that use content language integrated learning (CLIL) for STEM – science technology engineering mathematics (Li, 2018; Yidi, 2018).

Engineers are professionals who possess knowledge of engineering theory and technology, plus knowledge of legal requirements and practical standards for applying that engineering knowledge. To meet these objectives, material from USA amateur radio license examinations was included (FCC, 2019; ARRL, 2019b). License exams for amateur radio (also known as ham radio) contain questions on electrical and electronic engineering theory (such as Ohm's law), application of theory (such as choosing material for constructing antennas), and questions on rules and regulations (such as radio frequencies that we may transmit on). The questions and answers are publicly available, and are collectively known as the question pool. The questions appearing in the license exam are randomly chosen from the pool.

Engineering freshmen are familiar in their L1 with electrical and electronic theory, certainly at the lowest license level of licensure (the technician class license) and, for many students, even at the highest license level (the amateur extra class license). Familiarity with the theory allows ELLs to quickly grasp technical terminology (for example, ELLs learn in a few minutes how to say and answer questions like "calculate the oscillation frequency of the following LCR circuit" in L2). This means that for electrical and electronic theory, the bulk of learning is L2 vocabulary. Few theoretical concepts are introduced. This area of learning is STEM but hardly CLIL (if it is, it is of content-specific vocabulary and phrases).

Few ELLs are familiar with practical applications of theory in radio telecommunications, so they need more time to understand the content. For example, students who have learned the theory only in books do not know what resistors look like (they take many shapes and sizes) and have no idea how to read resistance values printed on the packaging (some are numbers, some are colored bands). Engineering students are excited to learn new practical knowledge, partly because much of it is standardized internationally. The ELLs learn through L2 knowledge that they can use in L1. This area of learning is STEM and CLIL of applied theory and practical technology.

Almost none of the ELLs in this study have ever seen even in their L1 the law, rules, regulations, and codes pertaining to electrical and electronic engineering. Engineers are rarely delighted with legal issues, but grudgingly accept their importance. ELLs want to know where to find information on legal requirements, electrical codes, professional standards, and best practices (the last refers to design and implementation decisions that are considered common sense in the industry, and that are often legally encouraged although not mandatory). Because many of the ELLs have been trained in the grammar translation (GT) method, they need to read the entire L2 material and convert it into L1 before they can summarize it or find relevant information in it. We seek to train scanning (British Council, 2019a) and skimming (British Council, 2019b) so that ELLs can quickly find relevant parts of the document that they should read in-depth. The ELLs are not asked to memorize rules and regulations, because they are mostly irrelevant to college study. This area of learning is CLIL of reading strategies (that is, of meta skills). CLIL of law does not take place beyond becoming initiated into the format and writing style of legal documents that students will encounter later in their professions.

All students are capable of online learning because they take compulsory courses that use it. Many students prefer blended learning (that is, a combination of online asynchronous learning and face-to-face real-time learning). Blended, flipped learning (Bergmann & Sams, 2012) allows active learning in the classroom. The passive or independent learning tasks can be delivered by CALL outside of class at times and places of the student's choosing. The active or interactive learning tasks can take place inside of class.

Students complete homework as long as they are graded, which is an advantage of submitting assignments via CALL. A typical student is less concerned with learning the subject matter than earning high grades. The wily instructor guides students towards studying by offering many tiny rewards to many tiny tasks (but grading many tasks accurately and fairly can be labor intensive). Online learning

or active learning do not save time or money. Rather, they help students achieve more by spending more time on task.

Materials and Methods

Learners and Course Format

The ELLs were 93 university freshmen having English language proficiency at the CEFR A2 or B1 levels. Sixty-three ELLs were engineering majors interested in learning electrical and electronic engineering through L2. Thirty ELLs were law and business majors interested in either electronics theory or law pertaining to technology.

Each class period lasted 90 minutes. Classes met one time per week for 15 weeks. Before each class, ELLs accessed an online learning system to complete flipped learning assignments that prepared them for the next class. During class, ELLs spoke with instructors, TAs (teaching assistants), and classmates. ELLs took midterm and final exams, which were partly oral and partly written.

Learning activities were designed using the 4C/ID model (van Merriënboer et al., 2002). This model allows us to build upon simple skills that culminate in complex skills. The learning objective is language proficiency (a complex skill), while learners perceive their assignments as filling in blanks or saying short utterances (simple skills). The course is designed such that it starts with simple skills which gradually integrates them in more complex activities.

Language Material

The FCC question pool (ARRL, 2019a), the US CFR (code of federal regulations; FCC, 2019), and a UK website that teaches electronics (Coates, 2018) were used. Material written by other people was preferred due to exposing learners to a variety of terminology and writing formats trains learners to understand various documents and utterances. Conversely, if we were to write all our material, our learners would be exposed to only one kind of terminology. Reliance on the publications of others, however, increases the risk of material becoming unavailable or outdated.

American and British English were mixed for the following two reasons:

- Juxtaposing US and UK terminology shows that language varies within a technical field (e.g., "antenna" vs "aerial," "commercial power" vs "mains," "ground," vs "earth," "wrench" vs "spanner"). Some Southeast Asian countries (where some of our graduates go to work) use UK terminology.
- In order to minimize the financial burden on our students, we found a UK website that teaches electronics for free. While the FCC question pool and some study guides are free (Benson, 2018; Chinn, 2016; eHam, 2016; Ham Radio School, 2018; Kemp, 2014; Tiley, 2016, Twigger, 2018), many study guides are not (ARRL, 2015; ARRL, 2016; ARRL, 2018; Romanchik, 2015; West, 2015a; West, 2015b; West, 2016).

Reading Skills

ELLs practiced how to skim and scan in L2. ELLs implicitly know how to do this in their L1. By learning the rigid structure of technical and legal documents, implicit knowledge shifts to explicit knowledge. Figure 1 shows examples of instruction intended to make implicit knowledge explicit. The differences between skimming and scanning are explained in Figure 1, first succinctly (1st figure section), then in detail (2nd figure section), followed by exercises (3rd figure section), and concluding in why we learn these skills (4th figure section).

Figure 1

Screenshots of Courseware for Reading Meta-skills

Skimming is reading a text quickly to **get a rough idea or summary**. Do not read every word when skimming. Speed is important.

For instance, instead of reading the whole text, we look at the title, introductions, and any diagrams and sub-headings. We then skim to get a clear general idea of what the text is about.

Scanning is reading a text quickly to **find specific information**, such as figures or names. Scanning is similar to using a "search" function in computer software.

For instance, instead of reading the whole text, we search for keywords (such as technical terms) to find the part of the text we need to read.

Some more information for teachers is at
https://www.teachingenglish.org.uk/article/skimming
https://www.teachingenglish.org.uk/article/scanning

Skimming

Before we start reading sentences in the document, you want to know what **parts** (that is, regions or blocks) make up the document.

The most important is the title. Titles come first, and are often in big bold font.

Many technical documents are broken down into sections, sub-sections, and sub-sub-sections. Most technical documents use decimal numbers to label and organize sections. Numbers can begin at 1 (1, 2, 3, ...) or 0 (0, 1, 2, 3, ...). For instance, we are looking at "conductors and insulators" 1 (section 1), "introduction" (section 1.0). The page you are looking at shows the section names above (see screenshot below) and, because this is the introduction, a summary of each section on the left (see screenshot below).

In technical documents, **the title and section headers always explain what is written in that part of the document**. They help you understand the document.

Compare technical documents with novels: Stephen King "It", 夏目漱石「坊ちゃん」. Their titles tell us nothing about the story. You have to read the story before you understand the title. But in technical documents, you read the section headers to quickly find the information you need. **Always grasp the parts of the document before reading it.**

In this document, the title, section headers, and figure captions tell us the following:
• this page is an "introduction" to an explaination of "conductors and insulators" (from title and section header)
• figure 1.0.1 is probably an example of a "complex circuit" (from figure caption)
• this page talks about a "simple circuit" (from section header)
• figure 1.0.2 says "simplified" (from section header)

Read sentence 1 of each section

Find the section headers.
Read sentence 1 (the 1st sentence) of each section. **Read fast. Do not stop** to look up words in the dictionary. Read the words you know. Type words that best fit each blank below.

Electrical conductors are materials that allow electric current to [_____] through them.

Metal conductors are often made of [_____], aluminum, and some alloys.

Conductive gases are gases that can [_____] current.

Insulators are materials that prevent the [_____] of electric current.

Do not worry if your choice of words does not exactly match my suggested answers. As long as you understand, you are fine.

You may wonder why we are not reading the entire document. There are 3 reasons.

(1) You can already read documents if you have lots of time. For instance, you could read "Module 2" in 3 days if you did nothing else. You need training in reading faster.

(2) You can already read longer documents that are familiar to you. For instance, you can probably read an English language translation of 夏目漱石「坊ちゃん」. This is because you know the content (what psychologists call "schema"). You need training in reading unfamiliar content.

(3) You can already find information in documents when you know their structure. For instance, you can open a newspaper, and jump to the sports section, because you know where the sports section is. You need training in finding information within documents.

Skimming lets you quickly find information in unfamiliar documents. This is a skill you will use for the rest of your life. Learn it now.

Figure 2 shows a screenshot of courseware for learning vocabulary. Reference material is given as a URL link to an external website ("Need help? Try <url>" located at the bottom of the figure). Using existing material helps instructors concentrate on developing tasks tailored to their students. EE is an area where a body of learning material exists. Leveraging preparation material for license exams allows instructors to guide students towards practice questions.

Figure 2

Screenshot of Courseware for Learning Vocabulary

Table 7.2
Some Common Decibel Values and
Power Level Ratios

P_2/P_1	dB
0.1	−10
0.25	−6
0.5	−3
1	0
2	3
4	6
10	10

A decibel ([dB]) is a unit that decribes the [____] between 2 values. The word "deci" means "0.1", as in "deciliter" ([dl]). The unit Bel ([B]) is named after Alexander Graham Bell, who invented the telephone as part of his effort to build hearing aids for hard-of-hearing people.

Look at the table above.

When $P_2/P_1 = 1$, then $10 * \log(P_2/P_1) = 10 * \log(1) = 0$. (The logarithms here are base 10.) We say that the "P2 is [____] [dB] over P1" (this means P2=P1).

When $P_2/P_1 = 2$, then $10 * \log(P_2/P_1) = 10 * \log(2) = 10 * 0.3010 = 3$. We say "P2 is [____] [dB] over P1".

When $P_2/P_1 = 1/4$, then $10 * \log(P_2/P_1) = 10 * \log(1/4) = 10 * (0 - 0.6020) = -6$. We say "P2 is [____] [dB] over P1" or "P2 is 6 [dB] below P1".

Need help? Try http://www.arrl.org/files/file/Get%20Licensed/PowerAndDec.pdf

Figure 3 shows a screenshot of courseware for raising awareness of US and UK English. ELLs are not required to memorize differences across varieties of English, but our EE material does include both American and British resources. When ELLs are unlikely to know the concept itself, the terminology is given in L1 (as in the paragraph beginning with "Look again at the section ..." located about a quarter from the top of the figure).

Figure 3

Screenshot of Courseware for Raising Awareness of US and UK English

British "mains" = American "commercial power"

English language differs between USA and Britain.

Look at the section "Dual potentiometer with two pole on/off switch". Sentence 2 says "old mains radio", which means "old radios that you would connect to the electrical power outlet on the wall". The word "mains" (always plural) is British. American say "commercial power" or "wall outlet".

Trivia (you can skip this section) -- Cocentric spindles

Look again at the section "Dual potentiometer with two pole on/off switch". Sentence 1 says "cocentric spindles". (Americans usually say "coaxial" rather than "cocentric". Japanese uses both 同軸 and 同芯.)

The photo below is an example of a coaxial pot (that is, cocentric spindle) sold at Mouser Electronics, a well-known supplier of electronics parts. Also shown is the dimensions from the data sheet. A data sheet explains the technical specifications of parts and products.

3310H-004-202L

BOURNS

Mouser #:	652-3310H-004-202L
Mfr. #:	3310H-004-202L
Mfr.:	Bourns
Customer #:	
Description:	Potentiometers 9mm 2Kohms Dual Cup
Datasheet:	3310H-004-202L Datasheet

Enlarge

Images are for reference only
See Product Specifications

Share

Compare Product   Add To Project   Add Notes

310-776730.pdf
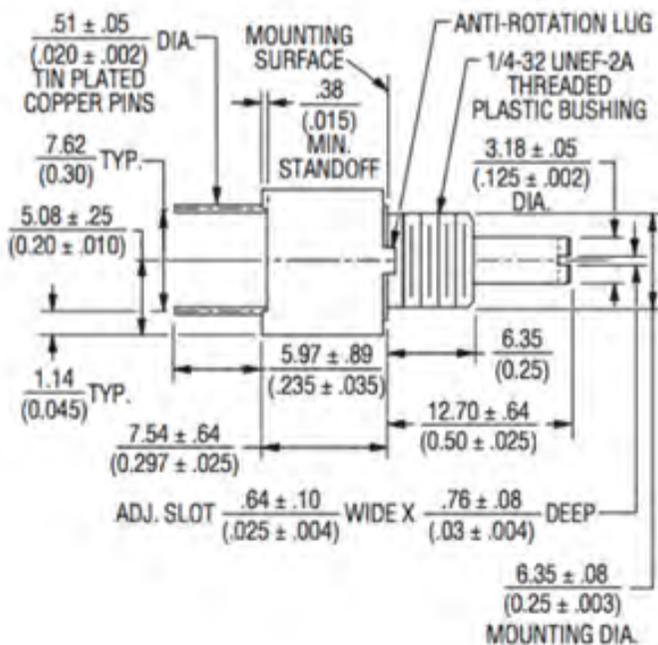
Figure 4 shows photographs of coaxial pots. Realism facilitates understanding, and when ELLs understand the text (even with the help of images) a sense of empowerment ensues. A personal touch may empathically connect ELLs and instructors (we took these photos ourselves). We enjoy the camaraderie of fellow engineers and scientists. Freely available learning material gives us time to focus on personalizing course material.

Figure 4

Photographs of Coaxial Pots

Coaxial pots are 2 pots in 1. There is the inner shaft (blue in the picture above, and black in the pictures below). There is an outer shaft (silver in the picture above, and also in the pictures below). Having 2 pots on 1 axis saves space on the control panel. It also helps group controls together. In the pictures below, my fingers are on the "MIC (microphone gain)" and "RF PWR (radio frequency power output)" controls, which are loosely connected -- they both control audio output transmitted by the radio.

Figure 5 shows a screenshot of courseware for CLIL. The calculations per se are known to students. The use of letters ("R," "K," "M") to donate both decimal point position and value multiplier is new knowledge for students. (Our students are trained in books about mathematical formulas rather than at laboratory benches with hardware tools). We use questions from freely available external websites (mentioned as "module 4.5" near the top of the figure). Instructors can skip developing material

that is expertly explained elsewhere. The time saved can be spent on developing succinct summaries or instructions using morphology and syntax appropriate to ELLs (as in the paragraph beginning with "The value 4K7 means 4.7 [kΩ] …" located near the top of the figure).

Figure 5

Screenshot of Courseware for CLIL

Resistor Networks Calculation Practice

Skip modules 4.3 and 4.4. Open module 4.5.

The problems below come from module 4.5.

The value "4K7" means "4.7 [kΩ]". The "." (decimal point) is too small to see. Engineers sometimes replace the "." with a letter ("k" for "1,000", "M" for "1,000,000"). This means that "4M7" means "4.7 [MΩ]". When we want to say "1" (that is, no letter, just [Ω]), we use "R". For example, "4R7" = "4.7 [Ω]", and "R47" = "0.47 [Ω]". The rule is (1) the letter shows the decimal point ("."), and (2) the letter shows the multiplier (R=1, K=1000, M=1000000 …). To learn more, see module 2.2, section "Decade Scaling".

1.

560R   1K   270R
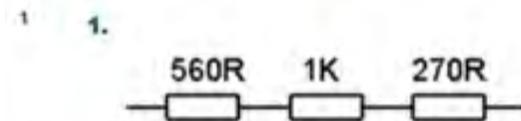
Calculate the total resistance of the network.

○ 831 [Ω]
○ 831 [kΩ]
○ 1.83 [kΩ]
○ 151 [kΩ]

3.

470R   680R
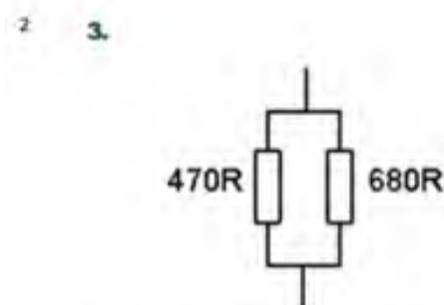
Calculate the total resistance of the network.

○ 1.36 [kΩ]
○ 1.15 [Ω]
○ 1.45 [kΩ]
○ 278 [Ω]

Writing Skills

According to Nation (2001), vocabulary use consists of three aspects of vocabulary knowledge: grammatical function, collocations, and constraints. Here, productive knowledge of collocations refers to knowing what words or types of words must be used or are often used with other words. Collocations are viewed as a form of multiple word items. Research suggests that collocations and other word chunks are stored in long-term memory as single units instead of single word items (Kuiper & Allan, 2004; Jiang & Nekrasova, 2007; Kim & Kim, 2012). If this is true, then learning collocations may be more effective than learning single word items – that is, learning a collocation may require the same amount of cognitive processing and teaching effort as learning a single word item. However, due to lack of structured pedagogy, knowledge of collocations is insufficient among ELLs across all proficiency levels (Nesselhauf, 2005; Fan, 2009; Laufer & Waldman, 2011).

We surveyed our ELLs' vocabulary, identified vocabulary items that ELLs passively know (that is, they understand the word when they hear or see it, but rarely or never write or say it), and required them to write and say those words along with their collocations. ELLs wrote paragraphs on non-engineering topics as online assignments on an online forum before class. Grading written posts and

spoken recordings is laborious, so instead of correcting output by ELLs, instructors and students exchanged comments on the content (not morphosyntax) of the posts and utterances. During class, ELLs expressed their comments with each other.

Figure 6 shows screenshots of online forum for exchanging comments on non-engineering topics. Each week, ELLs wrote 130-word passages on a different topic (e.g., should elementary schools in Japan teach English language, a restaurant you recommend). ELLs were given 6 words along with their common collocations that ELLs used in their writing. ELLs wrote comments to each other's posts and talked about these topics in class.

Figure 6

Screenshots of Online Forum

English language in elementary schools

本名を表示   コメントを段組みで表示   ＜ 一覧へ戻る

Sirokuro Puppy   2018年10月23日(火) 15:31

Write your ideas on the topic shown to you. You will talk about this topic in class with your TAs and classmates.

If you submit early (roughly before Monday midnight), your classmates and TAs might send you comments. When you respond to your classmates or TAs, you earn more points, based on the quantity and quality of your responses.

If you submit late (roughly after Tuesday morning), then you receive less points, because there is no time to interact with your classmates or TAs. You are likely to receive less points in the next class, because you will be less prepared.

Tell us whether elementary schools (that is, primary schools) in Japan should teach English language.

Here are some questions you can answer:

•When do people learn language the easiest?
•When do people want to learn language?
•Do elementary schools have English language teachers?
•How can we train English language teachers?
•Can adults learn English language?
•When did you start learning English language?

Of course you can create your own questions and answers.

Click on コメントする to open your comment screen. In the comment screen, choose your nickname (such as "Batman" -- this is the name other people will see), and write your comment.

Follow these rules:
•Write no less than **100 words (n >= 100)**.
•Finish your post in **15 minutes (t < 15)**. Write fast to practice talking.
•For each word of the week, **pick 1 or more collocations** (that is, phrases) shown below the word. **Combine the red word with one of the green words.** Using collocations makes your writing more fluent and native.
•Use **ALL** of the words of the week. **BOLD** them in your post.
•Upload your response and comment before the deadline. The earlier the better.
•Comment on 1 or more student's writing (you might earn bonus points).

Here are the words of the week.
Note: "sth" means "something", where you can use a noun.
"a/b" means "a or b".

acknowledge (verb)
meaning: accept the truth of, admit the existence of
adverb + acknowledge: fully, clearly, explicitly, officially, publicly
verb + acknowledge: fail to, refuse to, be forced to
phrases: be generally/widely/universally acknowledged

perspective (noun)
meaning: a particular attitude towards regarding something
adjective + perspective: different, new, broader, wider, cultural
verb + perspective: get sth into, put sth into, see sth in, adopt, lose
perspective + preposition: on, in
phrases: from the perspective of

doubt (noun)
meaning: a feeling of uncertainty
adjective + doubt: reasonable, considerable, serious, slight, growing, increasing
verb + doubt: have, feel, raise, clear up, cast, express
doubt + preposition: in, over, about
phrases: beyond a doubt, without a doubt, have your doubt about sth

regulation (noun)
meaning: rule, order
adjective + regulation: strict, increased, tough, tight, government
verb + regulation: call for, demand, introduce
regulation + preposition: by, on

enthusiastic (adjective)
meaning: eager, interested
adverb + enthusiastic: extremely, incredibly, all, really, not particularly, genuinely
verb + enthusiastic: feel, look, seem, sound, get, become

noticeable (adjective)
meaning: easily seen or noticed, clear, apparent
adverb + noticeable: extremely, especially, particularly, hardly, barely, quite, immediately
verb + noticeable: be, become
noticeable + preposition: to, in

Listening Skills

ELLs listened to recorded or streamed audio transmissions in CW (Morse code) and phone (voice). Examples of audio sources include (1) amateur radio two-way contacts – recorded audio of long-distance conversations between radio operators in SSB (single-side band), (2) WWV – recorded audio of a US government radio station that broadcasts the time of day in AM (amplitude modulation), and (3) LAX approach – live streaming audio in AM of air traffic controllers talking to aircraft coming towards Los Angeles international airport.

ELLs were asked to distinguish between one-way and two-way transmissions (that is, broadcasts vs conversations) and between modes of transmissions (Morse code vs voice), but were not expected to understand or memorize the content of transmissions. The listening experience showed how radio transmission signals degrade based on modulation, interference, and distance. Realizing severe signal degradation underscored the need to speak slowly and clearly using consistent phraseology in order to reduce ambiguity.

Figure 7 shows screenshots of courseware for listening to air traffic control radio communications. Our students are excited to hear aviation radio. Audio quality is poor partly because for historical reasons aviation retains the use of AM (noisy but resistant to signal degradation) instead of FM (arguably better audio quality) or digital modulation (can provide excellent audio quality but risky because audio is completely lost when signal is weak). Most of our students have not yet studied these technical aspects, which can be expanded in the CLIL reading material.

Figure 7

Screenshots of Courseware for Listening to Air Traffic Control Radio Communications

LAX final approach

Imagine we are flying towards LAX. We see the runway. What are the pilots and controllers saying?

Listen live

LAX final approach -- you need Flash in your web browser
LAX final approach -- you need an MP3 audio player such as iTunes

You may hear nothing for a while. Sometimes, nobody is talking, especially at night (roughly between 14:30 and 21:30 Japan time).

While you listen, answer questions below.

1   Of course you don't understand what they are saying. Don't worry about that. We want you to experience aviation radio, not to become an expert of it.

What phrases do you think you heard? Click the choices that are close to what you may have heard. I show you these choices to help you hear better.

- ☑ ... descend and maintain two thousand six hundred ... (meaning: fly lower at exactly 2600 feet)
- ☑ ... reduce speed one seven zero ... (meaning: fly slower at exactly 170 knots)
- ☑ ... cleared for two four right ... (meaning: land on runway 24R)
- ☑ ... visual approach ... (meaning: land while looking for other aircraft)
- ☑ ... three three point niner ... (meaning: change radio frequency to 133.9 MHz)
- ☑ ... descend via ironman ... (meaning: i am coming through a place in the sky called IRONMAN)

(5点)

2   Would you say the transmissions were clear? Or were they noisy? Choose all the statements you agree with.

- ☑ some people talk fast
- ☑ some transmissions are noisy
- ☑ some people talk with bad pronunciation
- ☑ i have no idea what they are talking about
- ☑ i think i could train myself to understand this

Speaking Skills

In our experience, asking ELLs to speak some sample phrases before coming to class is ineffective unless their utterances are graded. Online learning systems capable of recording speech encourage ELLs to speak before coming to class. The ELLs happily completed assignments as long as they were graded.

Through their assignments, ELLs learned how to say some types of mathematical equations, which in class they dictated to each other (one person says an equation, their partner writes it down). Likewise, ELLs learned the ICAO phonetic alphabet (the way to say "A-B-C" as "alfa-bravo-charlie"), which in class they spoke to spell their names to each other (ICAO, 2019, not to be confused with IPA, 2019).

During class, ELLs engaged in engineering conversations and "topic of the week" conversations (see Figure 6). The allocated time was 35 minutes each. Between the two conversations, we allocated 15 minutes to sing songs to learn linking and phonotactics (Suzaki & Kawai, 2017).

Results

Survey Results

The ELLs responded to an anonymous survey after their final exam, but before their grades were known. Based on a five-category Likert scale, the ELLs were shown a statement and asked to choose from "strongly agree," "somewhat agree," "neutral," "somewhat disagree," and "strongly disagree." Accordingly, the ELLs enjoyed the course, found the content useful, and believe that TAs improve the class (n = 77). Most students understood how to complete the assignments, felt that writing tasks helped with their vocabulary, yet felt that the assignment load was heavy.

Surprisingly, 14% of the students' reactions were "neutral," "somewhat disagree," or "strongly disagree," to the statement, "Generally speaking, we should use more English, because language skills do not improve if we use Japanese all the time," suggesting a weak but non-zero attachment to the GT method.

Overall, students seemed comfortable in the course:

48% stated "This class is just right for me, and I feel comfortable."

41% stated "This class is slightly advanced for me, but I do not feel uncomfortable."

They enjoyed the learning experiences:

46% stated "I enjoy almost all of the activities."

42% stated "I enjoy about two-thirds of activities."

Apparently, the course offerings excessively caused some hesitation among some students:

59% stated, "This class is much better than I expected."

25% stated, "This class is slightly better than I expected."

Based on write-in responses (ELLs wrote what came to their minds), the top benefits of the course included (1) talking only in L2 to many people, (2) learning wholly in L2, (3) chatting with TAs, and (4) singing songs. The worst aspects of our course included (1) heavy homework, (2) repetitive questions, especially on electronic theory, and (3) feeling shy talking with strangers.

The ELLs were asked the questions, "Help next year's student decide. What is this class about? Who should take this class? Who should avoid this class? Your comment may appear in next year's

syllabus (course offerings). You may write in either English or Japanese." Below are some responses written in L2 as-is.

> In this class, you should talking in English but you have not to be worry. You can talk if you do your assignment.

> Originally I didn't like speaking English and talking with unknown people. However! When I realized, I was looking forward to this class.

> Students don't like classroom lecture such as sitting all the time should take thins class.

> The students who like talking in English, want to improve their English comunication skills, and are interested in engineering should take this class. The students who dont't want to talk with strangers should not take this class.

> This clas is for everyone,you do not mind your English skill .Let's enjoy conversation.

> This class is for somebody who do not have courage to talk with foreign people but wants to enjoy English. Students can improve their English communication.

> This class is for someone who want to raise one's English skills of English and the ability to communicate with someone. Someone who want to explain own opinion in English will be comfortable in this class. Someone who come to class only for some credits won't be comfortable and may be avoid.

> Those who don't feel unconfortable to talk with strangers should take this class. However, it becomes chance for making new friends for everyone. I am not the person like this, but this class is interested for me and enjoyied this class.

> We can learn technology in English. So students who are interested in technology and English can enjoy this class but students who are not interested in them cannot enjoy this class. Also students who take this class have an opoortunity of talking with friends and TAs, so they should talk friendly.

> Who want to SPEAK English. Who have will to enjoy English class.

Subjective Analysis and Commentary

We were unable to measure the speed of skimming and scanning, because the CALL system does not measure response time of tasks. We were, however, able to measure the accuracy of what we wanted the ELLs to skim and scan. Based on introspective surveys, the ELLs (especially students who wished to avoid mistakes) spent considerable time reading the material they were assigned.

The stability of the language material is a concern. The amateur radio question pool is publicly available, and remains unchanged until it is replaced with a new edition every four years. Some study guides are free, but unlike the question pool, study guides are the intellectual property of their owners. Japan's copyright laws require us to dynamically access them each time we use them, instead of statically reading downloaded material.

Unlike 15 years ago, our learners are friendly, gregarious, and eager to talk (a contributing factor may be the government-mandated focus on English language conversation in middle schools and high schools). The learners are held back by lack of vocabulary. When learning technical English, the primary focus should probably be terminology.

One way to improve the student-to-instructor ratio (and perhaps to decrease the workload of grading homework) is by hiring or giving course credit to upperclassmen as mentors and courseware developers. We solidify our knowledge by imparting it to others. ELLs with high English language

proficiency who are exempted from English language courses are prime candidates for coaching underclassmen. Freshmen receive quality training, and sophomores enhance their mentoring skills. Our courses will benefit from courseware designed by students for students. The best ideas sometimes come from people closest to the learners. Learning is a creative democracy.

Conclusion

This paper does not seek to validate a hypothesis, but rather describes teaching practice that practitioners may find useful. The take-away message from this case study is as follows:
- open question pools exist for earning licenses of technical qualifications
- the question pools are surrounded by learning material (some free, some not)
- you can rely on, or contribute to, the body of learning material
- time saved can be spent on developing material tailored to your students

We reported on a case study of an EFL course that used CLIL for STEM intended for college freshmen majoring in science and engineering. We chose part of the course material from USA amateur radio license examinations because they contain questions on electrical and electronic engineering theory, application of theory, and questions on rules and regulations. Using free study guides liberates instructors to develop material suited for their students.

For students trained in engineering theory but not in practical applications, learning L2 vocabulary is the main task relating to engineering theory, and might barely be called STEM but certainly not CLIL. There was a mix of engineering and law students – for the latter, electrical theory was both STEM and CLIL. Learning applied theory and practical technology was both STEM and CLIL for almost all our students because few are trained in laboratory work. Learning meta-skills of reading was CLIL but not STEM.

The findings from our teaching practice is limited to the courseware and students in the current study. It is uncertain how these results can be generalized, however, it is hoped that this experience can help skilled practitioners create ideas for STEM and CLIL suited for their students.

References

ARRL (Amateur Radio Relay League). (2015). *The ARRL general class license manual* (8th ed.). Newington: ARRL.

ARRL (Amateur Radio Relay League). (2016). *The ARRL extra class license manual* (11th ed.). Newington: ARRL.

ARRL (Amateur Radio Relay League). (2018). *The ARRL ham radio license manual* (4th ed.). Newington: ARRL.

ARRL (Amateur Radio Relay League). (2019a). *Download or print amateur radio question pools*. **http://www.arrl.org/question-pools**

ARRL (Amateur Radio Relay League). (2019b). *Why should I get licensed?* **http://www.arrl.org/getting-licensed**

Benson, F.L. (2018). *NC4FB amateur radio*. **http://www.nc4fb.org**/

Bergmann, J., & Sams, A., (2012). *Flip your classroom: reach student in every class every day*. International Society for Technology in Education.

British Council. (2019a). *Scanning*. **https://www.teachingenglish.org.uk/article/scanning**

British Council. (2019b). *Skimming*. **https://www.teachingenglish.org.uk/article/skimming**

Chinn, R. (2016). *Amateur radio practice exams*. **https://hamexam.org**

Coates, E. (2018). *Learn about electronics*. **http://www.learnabout-electronics.org/index.php**

eHam. (2016). *Ham exams*. **http://www.eham.net/exams**/

Fan, M. (2009). An exploratory study of collocational use by ESL students – A task based approach. *System, 37*(1), 111–123. **https://doi.org/10.1016/j.system.2008.06.004**

FCC (Federal Communications Commission). (2019). *Amateur radio service*. 47 CFR (Code of federal regulations), Part 97.

Ham Radio School. (2018). *Welcome to HamRadioSchool.com!* **http://www.hamradioschool.com**/

ICAO (International Civil Aviation Organization). (2019). *Alphabet – Radiotelephony*. **https://www.icao.int/pages/alphabetradiotelephony.aspx**

IPA (International Phonetic Association). (2019). *The International phonetic alphabet and the IPA chart*. **https://www.internationalphoneticassociation.org/content/ipa**-chart

Jiang, N., & Nekrasova, T.M. (2007). The processing of formulaic sequences by second language speakers. *The Modern Language Journal, 91*(3), 433–445. **https://doi.org/10.1111/j.1540-4781.2007.00589.x**

Kemp, P. (2014). *The teacher's guide to amateur radio instruction*. **http://www.arrl.org/instruction-getting-organized/**

Kim, S.H., & Kim, J. H. (2012). Frequency effects in L2 multiword unit processing: Evidence from self-paced reading. *TESOL Quarterly, 46*(6), 1176–1182. **https://doi.org/10.1002/tesq.66**

Kuiper, K., & Allan, W.S. (2004). *An introduction to English language: Word, sound and sentence*. Palgrave Macmillan.

Laufer, B., & Waldman, T. (2011). Verb–noun collocations in second language writing: corpus analysis of learners' English. *Language Learning, 61*, 647–72.

Li, Y. (2018). *Aims and scope: International Journal of STEM Education*. **https://stemeducationjournal.springeropen.com/about**

Nation, I.S.P. (2001). *Learning vocabulary in another language*. Cambridge University Press.

Nesselhauf, N. (2005). *Collocations in a learner corpus*. John Benjamins Publishing Company.

Romanchik, D. (2015). *The no-nonsense, technician class license study guide for tests given between July 2014 and June 2018*. **http://www.kb6nu.com/study-guides/**

Suzaki, N., & Kawai, G. (2017). Encouraging blended learning via a group singalong activity for learning segmental and prosodic pronunciation features. *Proceedings of TESOL-2017*. TESOL.

Tiley, J. (2016). *Amateur radio level 1 technician license syllabus for the 2014 to 2018 question pool*. **http://www.vhfclub.org/downloads/License%20instructor%20materials/Instructor%20Guide.docx**

Twigger, S. (2018). *AA9PW amateur radio exam practice*. **http://aa9pw.com**

van Merriënboer, J., Clark, R., & de Croock, M. (2002). Blueprints for complex learning: The 4C/ID-Model. *Educational Technology Research and Development, 50*(2), 39–64.

West, G. (2015a). *Technician class 2014–2018 FCC element 2 amateur radio license preparation* (8th ed.). W5YI Group.

West, G. (2015b). *General class 2015–2019 FCC element 3 amateur radio license preparation* (9th ed.). W5YI Group.

West, G. (2016). *Extra class 2016–2020 FCC element 4 amateur radio license preparation* (7th ed.). W5YI Group.

Yidi, A. (2018). *What is STEAM?* **http://stemtosteam.org**

Author's Information:

Goh Kawai is an educational engineer who designs and evaluates online learning systems. He has a PhD in information and communication engineering. He worked at Xerox PARC, SRI International, University of Tokyo, University of California Santa Cruz, Oregon Health & Science Universty, and University of Antwerp. Website is **http://goh.kawai.com**.

Email: **goh@kawai.com**

7

Japanese Validation of the Smartphone Addiction Scale

Olivia Kennedy, Ritsumeikan University
Sandra Healy, Kyoto Institute of Technology

Abstract

The potential benefits of the introduction of smartphones to the language-learning classroom have led researchers to examine problematic use and the effects it has on student learning outcomes. Various studies have reported positive correlations between excessive smartphone usage and difficulties with meeting school and work commitments, interpersonal relations, physical health problems, and behavioral addiction (Akin et al., 2014; Choi et al., 2015; Chun et al., 2012), all of which may have an impact on language learning. Various scales to measure levels of smartphone usage and addiction have therefore been developed. This study is the first to establish a valid and reliable Japanese version of the Smartphone Addiction Scale (SAS) for Adolescents that was developed by Kwon, Lee et al. (2013). A meticulous translation was administered to 542 first year undergraduate students at a national university in Kyoto, Japan. A Confirmatory Factor Analysis showed that the data obtained did not have the same structure as that obtained by Kwon, Lee et al. (2013) and so an Exploratory Factor Analysis was undertaken which found four factors: *emotional attachment*, *cyber-oriented relationships*, *tolerance*, and *adverse physical effects*. These factors are explained in depth and illustrated with quotations from participants' written survey responses. High levels of dependency were found in participants reporting the highest levels of smartphone usage, with a mean overall SAS score of 97 out of a possible 198.

語学学習教室におけるスマートフォンの導入の潜在的な利点が着目されている一方で、スマートフォンの問題のある使用法と学生の学習成果に及ぼすその影響が調査されてきた。スマートフォンの極端な使用と学校や仕事での取組の達成、対人関係、身体の健康、中毒的行動等の様々な問題との明らかな相関関係があることがいくつかの研究で報告されており（Akin et al., 2014; Choi et al., 2015; Chun, et al., 2012）が、これらの関係はすべて言語学習に影響を与える可能性があるといえる。それゆえに、スマートフォンの使用頻度と中毒性を計測する様々な尺度が開発されてきた。本研究では、Kwon, Lee et al. (2013)が開発した思春期の若者向けのスマートフォン中毒尺度（SAS）をもとに、初めて日本人学習者を対象とした有効で信頼性の高い尺度を作成することを目的とし、調査を行なった。日本の京都の国立大学の学部1年生542名を対象に調査を行なったところ、確認因子分析により得られたデータはKwon, Lee et al. (2013) によって得られたものと同じ構造を持たないことが示された。そこで探索的因子分析を行なった結果、感情的愛着、サイバー指向の関係、耐性、身体的悪影響の4つの要因を発見した。これらの要因は、有効数の１９８のうちSAS平均スコア９７が示されているように、参加者の書面による調査回答から高いレベルの依存性がスマートフォンの使用頻度の高い参加者に見られ事が説明されている。

Keywords: **Smartphone addiction, adolescents, young adults, validation, scale, Japan**

Smartphones have become a ubiquitous part of modern life. Almost anything that can be done on a computer can now also be done on a smartphone, but with the added advantage of mobility. As in many countries, the majority of adolescents and emerging adults in Japan now own a smartphone, with some 97% of Japanese teenagers having a smartphone by 2014 (Cote et al., 2014). The high level of ownership has begun to have an impact on educational contexts as the use of smartphones both inside

and outside the classroom is increasingly accepted and valued. Online learning is perceived to have a number of advantages including increased autonomy and student independence, and also seen to be learner-centered, convenient, flexible, interactive, and cost-effective (Moore, 2013). Students increasingly use their smartphones to manage their schedules, submit assignments, contact one another and their teachers, and engage in online activities to learn English (Godwin-Jones, 2018). Some examples of educational technology that students use at the university where the present study was undertaken include: MReader **https://mreader.org** – a program that enables teachers to manage large numbers of students undertaking extensive reading; Duolingo **https://www.duolingo.com** – an application used to learn vocabulary; and Anki **https://www.ankiapp.com** – an application to manage the vocabulary students encounter in their English learning which replaces traditional pen-and-paper notebooks and flashcards. In addition, students in the classes where this research project was undertaken often use their devices in class to watch videos, do research, check the meaning of words in the dictionary, time activities and give presentations. Along with the potential benefits of the introduction of smartphones to the language-learning classroom, however, come issues related to problematic usage. One of these is smartphone addiction, and a variety of tools have been developed to measure it and the impacts that it has on the lives and learning outcomes of students (Mok et al., 2014). This study examines the development and application of a Japanese translation of the Smartphone Addiction Scale for Adolescents (SAS) that was developed by Kwon et al. (2013) and is the first to establish a valid and reliable version in the Japanese context.

Literature Review

A number of studies have been undertaken that explore the potential benefits of smartphone usage for language learning including portability, social interactivity, context sensitivity, connectivity, and individuality (Klopfer et al., 2002). Additionally, smartphones can be used for social networking, recording one's own voice, studying at one's own pace (Chartrand, 2016; Oberg, & Daniels, 2013), and even to provide immediate feedback, as seen in the PeerEval application **https://peereval.mobi** developed by Tom Robb which allows students to evaluate one another's presentations. Other research, however, has focused on the negative effects of excessive usage of smartphones, sometimes termed *smartphone addiction*. Recent literature compares smartphone addiction to other forms of behavioral addiction such as gambling or Internet addiction (Billeaux et al., 2015), and various studies have reported positive correlations between excessive smartphone usage and difficulties with interpersonal relations, meeting school and work commitments, physical health problems, and behavioral addiction (Akin et al., 2014; Choi et al., 2015; Chun et al., 2012).

Instruments designed to measure smartphone addiction have been developed and validated, for example, in Taiwan (Lin et al., 2015), Korea (Roh et al., 2018), and America (Smetaniuk, 2014). However, to date little research has been done in Japan. One example is the Smartphone Dependence Scale (J-SDS) developed by Ezoe et al. (2016). The 29-point Likert survey was shown to have a high degree of internal validity, with Cronbach's alpha values for the five constructs ranging from 0.69 to 0.87 and was found to be a reliable and valid scale for use with university students who may be at risk of developing smartphone dependence. As a result of exploratory factor analysis, a 5-factor structure was established: *craving and withdrawal, overuse and tolerance, virtual life orientation, disturbance of concentration in class, and physical symptoms*, and it also provided a clear picture of to what extent the participants in the survey felt dependent on their smartphones. A recent study by Tateno et al. (2019) examined the relationship between Internet addiction, smartphone addiction, and the risk of *hikikomori* – severe social withdrawal – in Japanese young adults. As part of that study, the short version of Kwon, Kim et al.'s (2013) Smartphone Addiction Scale (SAS-SV) was used to assess smartphone addiction levels. Although confirmation of the reliability and validity of their Japanese translation were not undertaken by Tateno et al., the results were consistent with those of the original scale.

In this study we examine the reliability and validity of a Japanese version of the original long version of the Smartphone Addiction Scale (SAS) developed in Korea by Kwon, Lee et al. (2013). The SAS is a self-diagnostic scale designed to identify participants with smartphone addiction problems and consists of 33 items. The scale ranges from 1 (strongly disagree) to 6 (strongly agree) and therefore total scores can run from 33 to 198 with higher scores indicating increased risk of smartphone addiction. In Kwon, Lee et al.'s study, the mean SAS score was 104.5 for the male participants and 112.7 for the female participants, and 110.02 for both. In addition, the validity and reliability of the SAS was examined, and it was found to be both valid and reliable, with an internal consistency of Cronbach α = 0.9674. Six factors were found: *daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. Daily-life disturbance* includes problems related to physical pain and sleep disturbances, but also to missing deadlines and problems concentrating. *Positive anticipation* refers to feelings of excitement in relation to smartphone use, but also negative feelings if unable to use the smartphone. *Withdrawal* describes negative feelings if a person is without their smartphone. *Cyberspace-oriented relationships* addresses the issue of friends made through smartphone usage being more intimate than friends made in real life. *Overuse* refers to uncontrolled use and the feelings of always wanting to use a smartphone. Finally, *tolerance* is the feeling of trying to control smartphone usage but failing to do so. Kwon, Kim et al. (2013) also developed a short version of the scale (SAS-SV) for adolescents which included only 10 items. Both the long and short instruments have been replicated in many studies worldwide, for instance in Turkey (Akin et al., 2014), in Italy (De Pasquale et al., 2017) and in Switzerland (Haug et al., 2015).

Method

The present study was undertaken at a national university in Japan. The participants (n = 542) were all science majors in their first year of a four-year undergraduate degree program and their ages ranged from 18 to 20. The data of 26 participants were removed as their responses were incomplete, so the data set is n = 516. There is a strong male gender bias, as 347 of the participants stated their gender as male and 150 as female, with 19 participants not stating their gender. Otherwise stated, 67% of the participants were male, 29% female and 4% non-specified.

The questionnaire (see Appendices A and B) was administered voluntarily by 12 teachers who distributed the questionnaires in their classrooms. They were asked not to influence the outcomes of the survey by discussing its content with their students. Consistent with university guidelines, informed consent was obtained prior to the administration of the instrument, with participants signing a short statement that explained that their choice whether or not to participate would not affect their course grades. Surveys were collected, and data collated and analyzed.

The survey instrument consisted of demographic questions (age, gender, length of smartphone ownership, and usage patterns) and the 33 questions from Kwon, Lee et al.'s (2013) Smartphone Addiction Scale. This was translated into Japanese in a process that consisted of forward-backward translation from English into Japanese and back again by native speakers of both languages in order to check the concepts had been fully understood and translated correctly. As part of this translation process, a slight modification was made to Question 8 in that the application Line **https://line.me** was added as it is the most popular social network service application presently used in Japan.

Results and Discussion

All the survey participants have a smartphone and have had one for an average of 4.2 years, with 74% of the participants reporting owning an iPhone, 19% an Android phone, and 7% of survey participants not specifying what type of device they own.

When assessing problematic smartphone usage, it is important to understand the usage habits of

individuals (Shin & Dey, 2013) so the participants in this study were asked about their smartphone usage. The first question asked how many times each day the participants used their smartphones. One caveat is that smartphone usage is commonly underestimated (Lee et al., 2017). Time values should therefore be understood as being indicative rather than absolute values. The options given were *under 10 between 10 and 20*, *20 to 30*, *30 to 40*, and *more than 40* times. This was based on how many times students unlocked their phones to use them. The results show that the majority, 61%, reported using their phones between 10 and 30 times per day, with 33% saying they use their phones more than 30 times per day as shown in Figure 1. A small percentage of students, 6%, said they used their phones less than 10 times per day with twice as many boys reporting this as girls. Lin et al. (2015) found that frequency of use was more highly correlated with smartphone dependency than length of use. In the present study, a high SAS score was also strongly correlated with frequency of use. The mean SAS score was 97, and as SAS score rose, so did frequency of use. Participants who reported using their smartphones less than ten times a day had a mean SAS score of 76, while participants who said that they unlocked their phones more than 40 times had a mean SAS score of 110.

Figure 1

Gender-specific Results of the Question, "How Many Times a Day Do You Use Your Smartphone?"
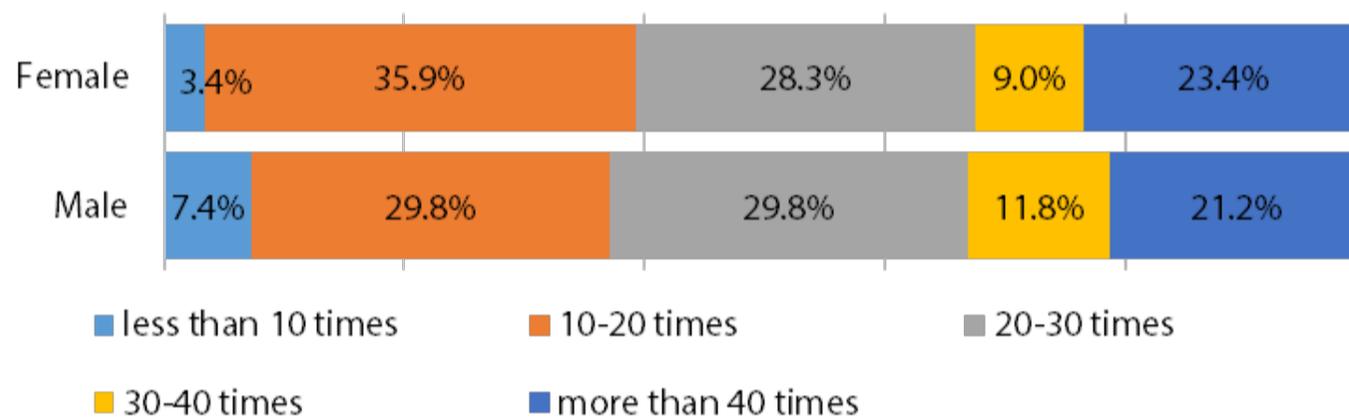
The second usage question asked about how much time participants spent using their phones. The options given were *less than an hour*, *between one and two hours*, *between two and three hours*, *between three and four hours*, and *more than four hours*. Figure 2 shows that 24% of the participants used their phones for over 4 hours per day, 22% between 3–4 hours, 30% between 2–3 hours, 22% between 1–2 hours and 2% less than 1 hour per day. Similar data was found in a study undertaken by Seo at the Japanese Mobile Marketing Data Institute (2018). There is a slight difference in the amount of time that male and female participants in our study reported spending on their phones, as can be seen in Figure 2. Tateno et al. (2019) similarly found that the Japanese males in their study used their phones for longer periods of time than the females, an average of 7.1 hours per day compared to 5.95 hours.

Figure 2

Gender-specific Results of the Question, "How Many Hours Each Day Do You Use Your Smartphone?"
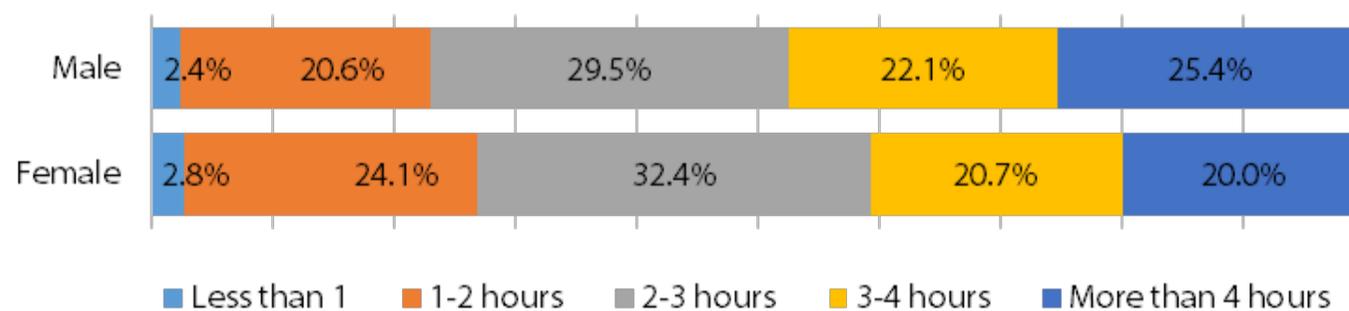
Next, participants were asked about the number of messages they sent each day, with the options *less than ten*, *between 10 and 20*, *between 30 and 40*, and *more than 40*. The results show that 37% of the participants report sending less than 10 messages per day, and 32% between 10 and 20 messages per day, as shown in Figure 3. 31% percent of the participants sent over 20 messages a day, 16% 20–30, 5% 30–40 and 10% over 40. Again, SAS scores increase with usage, with participants sending more than 40 messages having a mean score of 116. Users of social networking sites have been observed to have more issues with problematic smartphone use than non-users (Anderson et al., 2017).

Figure 3

Gender-specific Results of the Question, "How Many Messages Do You Send Each Day?"
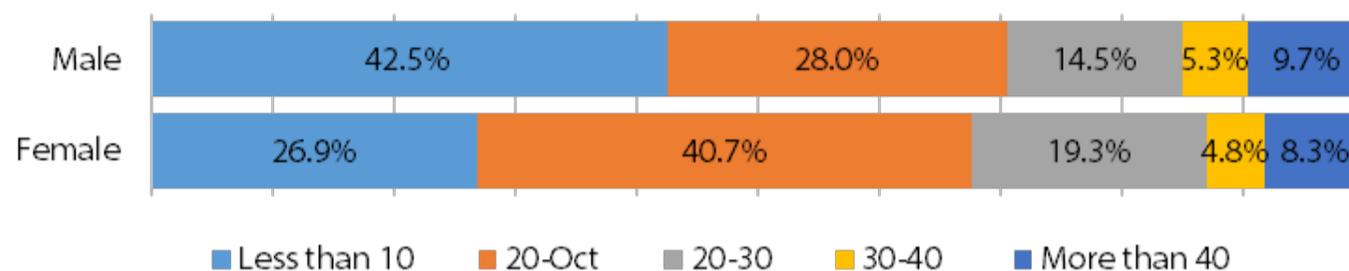
Finally, participants were also asked how many times each week they used their smartphones between 12 a.m. and 5:30 a.m. The options given were *zero*, *one to two, three to four*, *five to six*, or *seven* times per week. The results show 19% of the participants reported using their phones every night of the week during the night, with another 10% using it 5–6 times per week and 19% 3–4 times per week. 52% of the participants said they used their phones twice or less a week during the night. These results are shown in Figure 4. When asked in an open question why they were using their phones at night it was found that the majority were disturbed by notifications, but a large number also reported being unable to sleep or relax due to the need to check their phones. High SAS scores again correlated with the amount of smartphone usage, with participants using their phones every night having a mean score of 105, while participants who did not use their phones at all during the night had the lowest SAS scores, with a mean of 86.

Figure 4

Gender-Specific Results Of The Question, "How Many Nights Each Week Do You Use Your Smartphone Between 24:00 And 05:30?"
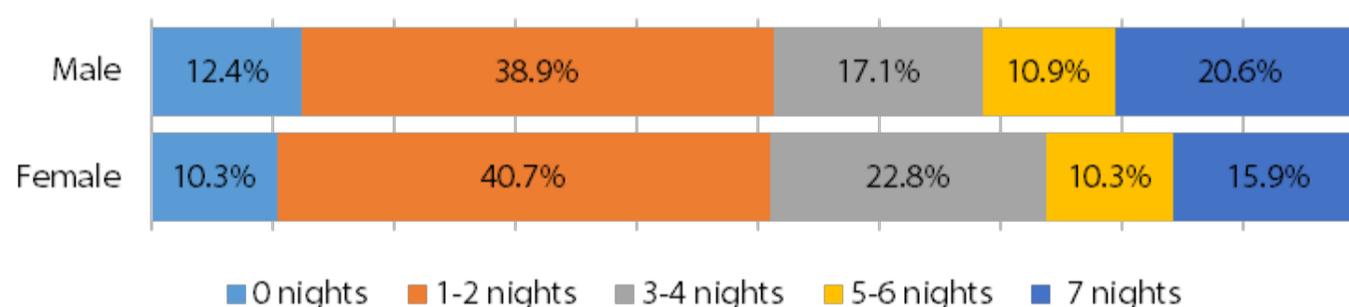
The assumptions for a confirmatory factor analysis were all verified. The sample size is adequate, with the final sample size of 516 providing a ratio of over 12 cases per variable. The Kaiser-Meyer-Olkin measure of sampling accuracy was calculated using R (R Core Team, 2019), and was found to be 0.936499, above the commonly recommended value of 0.6, also showing there was an adequate number of participants. Bartlett's test of sphericity was $\chi2(528) = 10074$, $p < .001$. The sample was found to be homogenous, with a Cronbach's alpha of 0.94, and was screened for univariate outliers, with none

found. To examine concurrent validity, we used Spearman's correlation coefficient to examine the relationship between the amount of smartphone use and total SAS score. Due to the non-linearity of the data, this was chosen rather than a Pearson's correlation coefficient.

Table 1

Mean Score For The Japanese Version of the SAS, Mean Smartphone Usage (Four Descriptors), And Spearman's Correlation Coefficient For Comparison Between SAS Score And Amount Of Smartphone Use

Categories	Mean/SD	Correlation coefficient
SAS Score	97.3/26.4	
Times used each day	3.1/1.2	0.33
Hours used each day	3.4/1.1	0.387
Messages sent each day	2.1/1.2	0.232
Nights used each week	2.9/1.3	0.244

A one-way analysis of variance and post hoc analyses were also performed to examine the relationships between the categories in Table 1. All analyses were performed using R (R Core Team, 2019). The analysis of the data was undertaken using Principal Components Analysis (PCA) and varimax rotation. PCA was chosen because of its ability to identify the minimum number of factors. The results are shown below in Table 2.

The factorability of the 33 items was examined and a correlation matrix showed that all items shared some common variance with other items. All but one correlated by 0.3 or more with at least one other item. Item Number 27 showed only a weak correlation, of 0.287, with item Number 30.

Eigenvalues showed that the first six factors explained 38%, 11%, 5%, 4%, 4%, and 3.6% of the variance respectively. Seven factors had eigenvalues higher than 1, the accepted cut-off point. Solutions for three, four, five, and six factors were each examined using the most common orthogonal method, varimax rotation. The four-factor solution, which explained 58% of the variance, was chosen due to the levelling off of the eigenvalues on the scree plot after four factors and also because of the difficulty of interpreting the fifth and sixth factors, which only correlated with one and two items respectively, and could, therefore, be disregarded.

Figure 5

Screen Plot of the Initial Factor Extraction
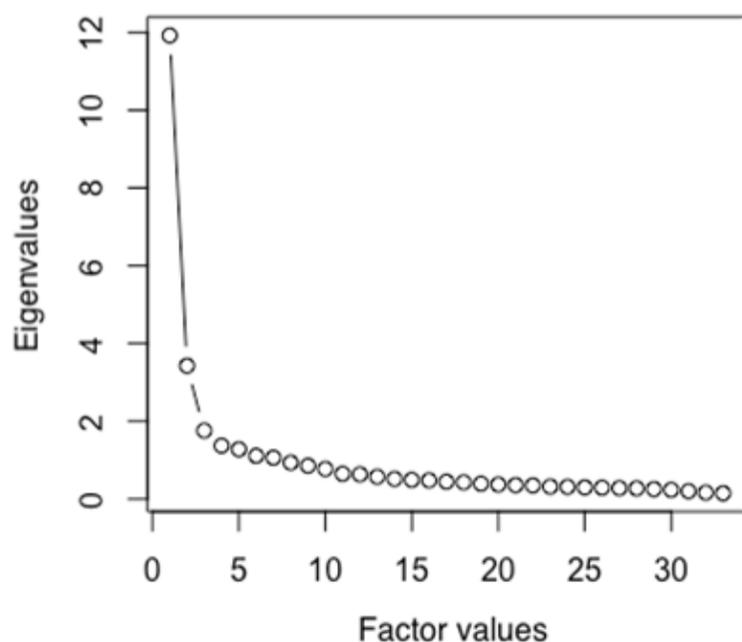
Table 2

Factor Loadings and Communalities Based on a Principal Components Analysis with Varimax Rotation for 29 Items of the Smartphone Addiction Scale (SAS) (N = 516)

No	Items	"Emotional Attachment"	Tolerance	"Cyber-oriented Relationships"	"Adverse Physical Effects"	Communality
1	Missing planned work due to smartphone use.		0.782			0.653
2	"Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use."	0.246	0.741			0.637
3	Experiencing lightheadedness or blurred vision due to excessive smartphone use.		0.252		0.661	0.559
4	Feeling pain in the wrists or at the back of the neck while using a smartphone.				0.849	0.755
5	Feeling tired and lacking adequate sleep due to excessive smartphone use.	0.212	0.455		0.529	0.536
6	Feeling calm or cozy while using a smartphone.	0.647	0.344			0.602
7	Feeling pleasant or excited while using a smartphone.	0.474	0.339			0.341
8	Feeling confident while using a smartphone.	0.486		0.459		0.478
9	Being able to get rid of stress with a smartphone.	0.573		0.227		0.408
10	There is nothing more fun to do than using my smartphone.	0.403		0.562		0.504
11	My life would be empty without my smartphone.	0.579		0.427		0.542
12	Feeling most liberal while using a smartphone.	0.626		0.386		0.566
13	Using a smartphone is the most fun thing to do.	0.468		0.499		0.484
14	Won't be able to stand not having a smartphone.	0.62	0.269			0.472
15	Feeling impatient and fretful when I am not holding my smartphone.	0.624	0.292	0.297		0.6
16	Having my smartphone in my mind even when I am not using it.	0.587		0.316	0.272	0.557
17	"I will never give up using my smartphone even when my daily life is already greatly affected by it."	0.559	0.424			0.54
18	Getting irritated when bothered while using my smartphone.	0.584	0.249	0.298	0.204	0.534
19	Bringing my smartphone to the toilet even when I am in a hurry to get there.	0.365	0.332	0.242		0.319
20	Feeling great meeting more people via smartphone use.			0.605		0.4
21	"Feeling that my relationships with my smartphone buddies are more intimate than my relationships with my real-life friends."			0.903		0.841
22	Not being able to use my smartphone would be as painful as losing a friend.	0.48		0.491		0.484
23	Feeling that my smartphone buddies understand me better than my real-life friends.			0.832		0.741
24	"Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook."	0.333	0.236	0.352		0.308
26	Preferring talking with my smartphone buddies to hanging out with my real-life friends or with the other members of my family.	0.235		0.82		0.75
29	Using my smartphone longer than I had intended.		0.759			0.625
30	Feeling the urge to use my smartphone again right after I stopped using it.	0.431	0.635			0.624
31	"Having tried time and again to shorten my smartphone use time, but failing all the time."	0.353	0.665			0.597
32	Always thinking that I should shorten my smartphone use time.		0.582			0.353

Note. Factor Loadings <.2 are suppressed. Items Number 25, 27, 28 and 33 have been removed.

Four items were removed because their factor loadings were very low. They were "Checking SNS (Social Networking Service) sites like Twitter or Facebook right after waking up," "Preferring searching from my smartphone to asking other people," "My fully charged battery does not last for one whole day," and "The people around me tell me that I use my smartphone too much." Traditionally, items with factor loadings smaller than 0.35 are removed. These items had factor loadings of 0.283, 0.231, 0.324, and 0.349 respectively.

Table 3

Descriptive Statistics for the Four SAS Factors (N = 516)

Factors	No. of items	M(SD)	Skewness	Kurtosis	Cronbach's α
Emotional attachment	12	35.76(11.60)	0.29	−0.10	.91
Cyber-oriented relationships	8	16.22(6.99)	1.16	1.49	.88
Tolerance	6	23.51(6.55)	−0.38	−0.13	.88
Adverse physical affects	3	10.18(2.74)	0.56	−0.56	.79

From Table 3 we can see the skewness and kurtosis were found to be acceptable. The skewness values are all close to zero with the exception of Factor 2, *cyber-oriented relationships*, which is acceptable given the structure of the data. Kurtosis should fall between plus or minus 2 (George & Mallery, 2010) and the results of all four factors are all within this range. Therefore, the data has a normal univariate distribution.

Discussion

Exploratory factor analysis of the Japanese translation of Kwon, Lee et al.'s (2013) SAS found four factors: *emotional attachment, cyber-oriented relationships, tolerance*, and *adverse physical effects*. The first of these, *emotional attachment*, includes both positive and negative feelings towards smartphones and their usage. The factor covers a wide range of emotions, from feelings of warmth, security and comfort, to the inability to stand being without a smartphone for even a few minutes. The most common comment was that their smartphone is "convenient," but many participants also commented on how life has changed for the better. Some sample comments (translated from Japanese by the authors) include: "Since getting my smartphone, my life has become prosperous;" "My relationships with the other members of my club are so much easier now that I have a smartphone;" and "I can text my family anytime I want to now." A number of comments referred to changes in academic study: "I never don't know anything anymore: I can always check whatever I need to;" and "I can do so many more things now." Other comments from participants included using their phones to do presentations in class and to work easily with other students on projects. References were also mentioned to specific applications such as, "I'm keeping up with M-reader much better now I can use my phone." Additionally, the participants referred to successfully using Anki and Duolingo to improve their grades. Other positive comments related to participants being comforted by their smartphones, for example, "I think that stress will be released on the Internet;" "I use my smartphone to kill time;" and "It stops me feeling lonely." Some participants, however, commented on how text messages can interfere with other activities: for example: "I don't want to go to sleep because I want to reply immediately when important messages come," and "I am often woken up by notifications."

The factor *cyber-oriented relationships* refers to the online friendships the participants have and compares them to the relationships they have in the real world. This factor measures two things: the extent to which survey participants feel that communication via one's smartphone is more enjoyable or allows for deeper communication than face-to-face communication, and the extent to which survey participants prefer spending time using their smartphones to spending time communicating with people in reality. A large majority of the participants in the present study agreed with survey item Number

21 (Feeling that my relationships with my smartphone buddies are more intimate than my relationships with my real-life friends), with 57% of participants choosing *strongly agree,* and 21% participants choosing *agree.* Similarly, 60% of participants strongly agreed and 19% of participants agreed with survey item Number 23 (Feeling that my smartphone buddies understand me better than my real-life friends). Comments included: "It is easier to communicate with people via smartphone," and "I've made friends through social networking sites." Research has found that males and females participate in online communities differently, with females focusing on social networking and males on online gaming and this may affect they type of cyberfriendships they have (Anderson et al., 2017). It also may explain the results of the present study which show that females send more messages, but males have longer usage time. Both male and female participants made comments concerning texting fellow students, with several explaining that texting allowed them more time to choose their words than in spoken conversations. In contrast, only one participant wrote about the importance of real-life contact, saying that, "It is easier to give someone an accurate impression if you talk to them directly."

The third factor found in this study, *tolerance,* combines two factors, *tolerance* and *overuse*, from Kwon et al.'s (2013) original factor analysis. Participants using their smartphones longer than they had intended and suffering adverse consequences from doing so are combined with feelings of being unable to refrain from using their devices and needing to spend increasing amounts of time using them to feel satisfied. Some comments included, "I just can't stop playing games;" "I sometimes think I want to stop using my phone so much, but I never do." Two participants mentioned the difficulty of staying on task when using their smartphone for class or homework activities, describing being interrupted not only by notifications and alerts, but also by their own impulses to search for things that interest them, listen to music, or chat with their friends. Distraction, it seems, often derails accomplishment for these students.

Finally, the fourth factor, *adverse physical effects,* describes the problems with vision that can occur from spending long periods focused on a small screen held close to the face, problems with back pain from bending over to look at the screen, and problems in the hands and wrists due to unnatural posture. The low mean for this factor (10.18) shows how little the participants are aware of these problems. No participants commented on physical pain or sight issues caused by smartphone usage. This factor also includes life disturbances caused by lack of sleep, itself caused by using a smartphone late into the night, or throughout the night. Several participants wrote comments about having difficulty concentrating in class due to sleepiness. One example: "Everyone has their phone in bed, but it doesn't lead to restful sleep, so sometimes I nod off in class."

Limitations / differences with previous research

There are several factors that may have led to differing results to Kwon, Lee et al. (2013) in this study. Firstly, the gender balance of the participants was different to the original SAS study in which the number of male participants was 32% and the number of female participants 68% (para. 2). The gender balance in the present study was almost the opposite, with 67% of the participants being male and 33% female. In addition, the ages of the participants differed in the two studies with the ages ranging from 18 to 53 years (M = 26.06; SD = 5.96) in Kwon, Lee et al.'s (para. 2, 2013) SAS study, and from 18 to 21 years (M = 19.34 years; SD = 1.103) in the present study. Furthermore, the sample sizes were different. In the present study there were 542 participants whereas in Kwon, Lee et al.'s study there were only 197 participants (para. 2). A larger sample size gives higher levels of confidence and a narrower margin of error in statistical testing. Another difference regards the correlations between the educational background of participants and their smartphone dependence levels. Because all of the participants in the present study are students at a national university in Japan, they form a limited group of highly educated individuals and therefore the results may not be generalizable to other groups. In addition, Haug et al. (2015) found that lower educational levels correlated with higher

levels of smartphone addiction. Finally, although there are only six years between the two studies, great advancements have been seen in the variety of applications available and their technical specifications, as well as increased levels of acceptance of smartphone usage in both educational contexts and society at large, which may have had some impact on the results.

Conclusion

This study examined the reliability and validity of a Japanese version of the Smartphone Addiction Scale (SAS) developed in Korea by Kwon, Lee et al. (2013) in order to create an instrument that would allow smartphone addiction levels of Japanese university students to be assessed. This information is important in that it allows institutions and instructors to better understand student needs and expectations as regards the usage of these devices for learning purposes, allowing for their smoother integration into classroom and mobile learning applications. The participants in this study were found to have a mean SAS of 97, with students reporting higher smartphone usage (both in terms of time spent and number of physical interactions with the device) having higher means than their peers. An exploratory factor analysis of the original SAS found six factors: *daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse,* and *tolerance.* This study found a 4-factor model to be more suitable in the Japanese context. The four factors are *emotional attachment, cyber-oriented relationships, tolerance, and adverse physical effects.* The results showed that the present instrument is a useful tool to assess addiction levels in Japanese emerging adults. Some refinement of the tool for the Japanese context would improve its effectiveness and a revision of the survey questions has been undertaken and will be trialed in the next survey. Additionally, an analysis of the short version (SAS-SV) of the original survey, developed by Kwon, Kim et al. (2013), and translated into Japanese has also been prepared and is forthcoming.

References

Akin, A., Altundag, Y., Turan, M. E., & Akin, U. (2014). The validity and reliability of the Turkish version of the smart phone addictions scale-short form for adolescents. *Procedia – Social and Behavioral Sciences, 152,* 74–77.

Anderson, E. L., Steen, E., & Stavropoulos, V. (2017). Internet use and problematic Internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *International Journal of Adolescence and Youth.* https://doi.org/10.1080/02673843.2016.1227716

Billieux, J., Maurage, P., Lopez-Fernandez, O., Kuss, D. J., & Griffiths, M. D. (2015). Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. *Current Addiction Reports, 2*(2), 156–162. https://doi.org/10.1007/s40429-015-0054-y

Chartrand, R. (2016). Advantages and disadvantages of using mobile devices in a university language classroom. *Bulletin of the Institute of Foreign Language Education Kurume University, 23,* 1–13. http://hdl.handle.net/11316/445

Choi, S., Kim, D., Choi, J., Ahn, H., Choi, E., Song, W., Kim, S., & Youn, H. (2015). Comparison of risk and protective factors associated with smartphone addiction and Internet addiction. *Journal of Behavioral Addictions, 4*(4), 308–314. https://doi.org/10.1556/2006.4.2015.043

Chun, H., Lee, H., & Kim, D. (2012). The integrated model of smartphone adoption: Hedonic and utilitarian value perceptions of smartphones among Korean college students. *Cyberpsychology, Behavior, and Social Networking.* https://doi.org/10.1089/cyber.2012.0140

Cote, T., Milliner, B., Flowers, S., & Ferreira, D. (2014). What's going on at the MALL? *PeerSpectives, 12*, 37–40.

De Pasquale, C., Sciacca, F., & Hichy, Z. (2017). Italian validation of Smartphone Addiction Scale Short Version for adolescents and young Adults (SAS-SV). *Psychology, 8*(10). 1513–1518. **https://doi.org/10.4236/psych.2017.810100**

Ezoe, S., Iida, T., Inoue, K., & Toda, M. (2016). Development of a Japanese version of Smartphone Dependence Scale. *Open Journal of Preventative Medicine, 6*, 179–185. **https://doi.org/10.4236/ojpm.2016.67017**

George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference, 17.0 update, (10a ed).* Pearson.

Godwin-Jones, R. (2018). *Using mobile devices in the language classroom: Part of the Cambridge Papers in ELT series.* [pdf] Cambridge University Press.

Haug, S., Castro, R. P., Kwon, M., Filler, A., Kowatsch, T., & Schaub, M. P. (2015). Smartphone use and smartphone addiction among young people in Switzerland. *Journal of Behavioral Addictions, 4*(4). **https://doi.org/10.1556/2006.4.2015.037**

Information and Communications Bureau. (2017). *Information and information communications technology.* Japan Ministry of Internal Affairs and Communications.

Klopfer, E., Squire, K., & Jenkins, H. (2002). Environmental detectives: PDAs as a window into a virtual simulated world. In *Proceedings. IEEE International Workshop on Wireless and Mobile Technologies in Education.* 95–98. IEEE.

Krosnick, J. A., & Presser, S. (2009). Question and questionnaire design. In J. D. Wright & P. V. Marsden (Eds.), *Handbook of Survey Research* (2nd ed.). Elsevier.

Kwon, M., Lee, J., Won, W., Park, J., Min, J., & Hahn, C. (2013). Development and validation of a Smartphone Addiction Scale (SAS). *PLoS ONE, 8*(2), e56936. **https://doi.org/10.1371/journal.pone.0056936**

Kwon, M., Kim, D., Cho, H. & Yang, S. (2013). The Smartphone Addiction Scale: Development and validation of a short version for adolescents. *PloS ONE, 8(12)*, e83558. **https://doi.org/10.1371/journal.pone.0083558**

Lee, H., Ahn, H., Nguyen, T. G., Choi, S. W., & Kim, D. J. (2017). Comparing the self-report and measured smartphone usage of college students: A pilot study. *Psychiatry Investigation, 14*(2), 198–204. **https://doi.org/10.4306/pi.2017.14.2.198**

Lin, Y. H., Lin, Y. C., Lee, Y. H., Lin, P. H., Lin, S. H., Chang, L. R., Tseng, H. W., Yen, L. Y., Yang, C. C., & Kuo, T. B. (2015). Time distortion associated with smartphone addiction: Identifying smartphone addiction via a mobile application (App). *Journal of Psychiatric Research, 65,* 139–145.

Line (2012). Line Corporation. Retrieved May 5, 2019 from **https://line.me**

Mok, J. Y., Choi, S. W., Kim, D. J., Choi, J. S., Lee, J., Ahn, H., Choi, E. J., & Song, W. Y. (2014). Latent class analysis on internet and smartphone addiction in college students. *Neuropsychiatric Disease and Treatment*, *10*, 817.

Moore, M. G. (Ed.). (2013). *Handbook of distance education* (3rd ed.). Routledge.

Nemoto, T., & Beglar, D. (2014). Developing Likert-scale questionnaires. In N. Sonoda & A. Krause (Eds.), *JALT2013 Conference Proceedings.* JALT.

Oberg, A., & Daniels, P. (2013) Analysis of the effect a student-centred mobile learning instructional method has on language acquisition, *Computer Assisted Language Learning*, *26*(2), 177–196. **https://doi.org/10.1080/09588221.2011.649484**

R Core Team. (2019). R: A language and environment for statistical computing. *R Foundation for Statistical Computing.*

Roh, D., Bhang, S., Choi, J., Kweon, Y. S., Lee, S., & Potenza, M. N. (2018). The validation of Implicit Association Test measures for smartphone and Internet addiction in at-risk children and adolescents. *Journal of Behavioral Addictions*, *7*(1). **https://doi.org/10.1556/2006.7.2018.02**

Seo, A. (2018). *2018 Version: Smartphone User Survey*. Retrieved from **https://mmdlabo.jp/investigation/detail_1760.html**

Shin, C., & Dey, A. K. (2013). Automatically detecting problematic use of smartphones. In *Proceedings of the 2013 ACM international joint conference on pervasive and ubiquitous computing*. 335–334. ACM.

Smetaniuk, P. (2014). A preliminary investigation into the prevalence and prediction of problematic cell phone use. *Journal of Behavioral Addictions, 3*(1), 41–53. **https://doi.org/10.1556/JBA.3.2014.004**

Tateno, M., Kim, D. J., Teo, A. R., Skokauskas, N., Guerrero, A., & Kato, T. A. (2019). Smartphone addiction in Japanese college students: Usefulness of the Japanese version of the Smartphone Addiction Scale as a screening tool for a new form of Internet addiction. *Psychiatry Investigation*, *16*(2), 115–120. **https://doi.org/10.30773/pi.2018.12.25.2**

Appendix A

English Version of the Student Survey

	Items	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
1	Missing planned work due to smartphone use	1	2	3	4	5	6
2	Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use	1	2	3	4	5	6
3	Experiencing lightheadedness or blurred vision due to excessive smartphone use	1	2	3	4	5	6
4	Feeling pain in the wrists or at the back of the neck while using a smartphone	1	2	3	4	5	6
5	Feeling tired and lacking adequate sleep due to excessive smartphone use	1	2	3	4	5	6
6	Feeling calm or cozy while using a smartphone	1	2	3	4	5	6
7	Feeling pleasant or excited while using a smartphone	1	2	3	4	5	6
8	Feeling confident while using a smartphone	1	2	3	4	5	6
9	Being able to get rid of stress with a smartphone	1	2	3	4	5	6
10	There is nothing more fun to do than using my smartphone	1	2	3	4	5	6
11	My life would be empty without my smartphone	1	2	3	4	5	6
12	Feeling most liberal while using a smartphone	1	2	3	4	5	6
13	Using a smartphone is the most fun thing to do	1	2	3	4	5	6
14	Won't be able to stand not having a smartphone	1	2	3	4	5	6
15	Feeling impatient and fretful when I am not holding my smartphone	1	2	3	4	5	6
16	Having my smartphone in my mind even when I am not using it	1	2	3	4	5	6

	Items	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
17	I will never give up using my smartphone even when my daily life is already greatly affected by it	1	2	3	4	5	6
18	Getting irritated when bothered while using my smartphone	1	2	3	4	5	6
19	Bringing my smartphone to the toilet even when I am in a hurry to get there	1	2	3	4	5	6
20	Feeling great meeting more people via smartphone use	1	2	3	4	5	6
21	Feeling that my relationships with my smartphone buddies are more intimate than my relationships with my real-life friends	1	2	3	4	5	6
22	Not being able to use my smartphone would be as painful as losing a friend	1	2	3	4	5	6
23	Feeling that my smartphone buddies understand me better than my real-life friends	1	2	3	4	5	6
24	Constantly checking my smartphone so as not to miss conversations between other people on Twitter or LINE	1	2	3	4	5	6
25	Checking SNS (Social Networking Service) sites like Twitter or Instagram right after waking up	1	2	3	4	5	6
26	Preferring talking with my smartphone buddies to hanging out with my real-life friends or with the other members of my family	1	2	3	4	5	6
27	Preferring searching from my smartphone to asking other people	1	2	3	4	5	6
28	My fully charged battery does not last for one whole day	1	2	3	4	5	6
29	Using my smartphone longer than I had intended	1	2	3	4	5	6
30	Feeling the urge to use my smartphone again right after I stopped using it	1	2	3	4	5	6
31	Having tried time and again to shorten my smartphone use time, but failing all the time	1	2	3	4	5	6
32	Always thinking that I should shorten my smartphone use time	1	2	3	4	5	6
33	The people around me tell me that I use my smartphone too much	1	2	3	4	5	6

Appendix B

Japanese Version of the Student Survey

	SAS	とても当てはまる	やや当てはまる	どちらかと言えば当てはまる	どちらかと言えば当てはまらない	あまり 当てはまらない	全く 当てはまらない
1	スマホ使用のため、計画していた勉強や仕事ができなかった事がある。	1	2	3	4	5	6

	SAS	とても当てはまる	やや当てはまる	どちらかと言えば当てはまる	どちらかと言えば当てはまらない	あまり当てはまらない	全く当てはまらない
2	スマホ使用のため、授業や宿題、仕事に集中するのが難しいときがある。	1	2	3	4	5	6
3	スマホの過剰な使用のため、目眩をおこしたり視界がぼやけたりした事がある。	1	2	3	4	5	6
4	スマホ使用中に肩・頭・手首に痛みを感じることがある。	1	2	3	4	5	6
5	スマホの過剰な使用のため、疲れを感じたり睡眠不足を経験した事がある。	1	2	3	4	5	6
6	スマホを使っていると落ち着く	1	2	3	4	5	6
7	スマホを使っていると楽しい	1	2	3	4	5	6
8	スマホを使っていると自信が湧く	1	2	3	4	5	6
9	スマホを使ってストレス発散ができる	1	2	3	4	5	6
10	スマホを使う事より楽しい事がない	1	2	3	4	5	6
11	スマホがないと人生が虚しく感じる	1	2	3	4	5	6
12	スマホを使っていると解放感を感じる	1	2	3	4	5	6
13	スマホを使う事が一番楽しい	1	2	3	4	5	6
14	スマホがない生活に耐えられない。	1	2	3	4	5	6
15	スマホが手元にないとイライラして落ち着かない。	1	2	3	4	5	6
16	スマホを使っていない時にもスマホのことを考える。	1	2	3	4	5	6
17	日常生活に悪い影響があっても、スマホを手放せない。	1	2	3	4	5	6
18	スマホを使っている時に邪魔をされるとイラつく	1	2	3	4	5	6
19	トイレに急いでいる時でもスマホを持って行く	1	2	3	4	5	6
20	ネットでより多くの人と知り合えることに喜びを感じる	1	2	3	4	5	6
21	現実の友達よりネット上の友達の方が強い結びつきを感じる	1	2	3	4	5	6
22	スマホを使用できないことは友達をなくすのと同じぐらい辛い	1	2	3	4	5	6
23	ネット上の友達は現実の友達より自分を理解してくれる	1	2	3	4	5	6
24	Twitter・Instagram・LINE上の他人同士の会話を見逃さないため、常にスマホを確認してしまう。	1	2	3	4	5	6
25	起きてすぐTwitterやInstagramなどのSNSを確認する。	1	2	3	4	5	6
26	現実の友達や家族と過ごすより、ネット上の友達と会話する方を好む。	1	2	3	4	5	6
27	人に聞くより、スマホに検索する方を好む。	1	2	3	4	5	6
28	スマホの充電が1日持たない。	1	2	3	4	5	ない
29	思っていたよりも長くスマホを使ってしまう。	1	2	3	4	5	6
30	スマホを使用後すぐにまた使いたくなる。	1	2	3	4	5	6
31	スマホの使用時間を短縮しようとするが出来ない	1	2	3	4	5	6
32	スマホの使用時間を短縮するべきだといつも思う。	1	2	3	4	5	6
33	親しい人から「スマホを使い過ぎる」と言われることがある。	1	2	3	4	5	6

Author's Information:

Olivia Kennedy is a lecturer at Ritsumeikan University. She is interested in the interface of technology and the language learning classroom.
Email: **okennedy@fc.ritsumei.ac.jp**

Sandra Healy is an associate professor at Kyoto Institute of Technology and her research interests include the use of technology in the classroom and how the intersection of gender and identity impact on language learning.
Email: **sandyhealy26@googlemail.com**

8

Dialogistic Stance on the Move: Published and EFL Proficiency-based Learner Abstracts in Applied Linguistics

Ming-Chia Lin, National Academy for Educational Research, Taiwan

Abstract

This study examined the distributions of element standards and dialogistic stances (engagement, graduation, and appreciation) on rhetorical moves in EFL proficiency-based learner and published abstracts in applied linguistics. The Learner Abstract Corpus (LAC) was compiled from Taiwanese post-graduate students' responses to timed research abstract writing assessment. The LAC of 185 abstracts was classified into three sub-corpora (the LASC): the low (Score 0–3, accounting for 39.15% of the LASC), the intermediate (Score 4–5, 39.18%), and the high-proficiency-level (Score 6–10, 21.67%). The Published Abstract Corpus (the PAC) was compiled from six prestigious journals (7 from each). The cross-corpus comparison was conducted mainly using the *AntConc* program, particularly for tagging rhetorical moves and element standards, and identifying evaluation devices. The results reveal the misuses of element standards, and the underuses and overuses of dialogistic stances on the moves across the LASC, when compared with the PAC. The higher-level learners expressed more dialogistic stances at the inter-clause, while the lower level expressed more at the intra-clause level. On the results and conclusion moves, the published writers often express expansive engagement in the main clauses, and maintain their stances by deploying appreciation and graduation devices in the following clauses. On the background and results moves, the published writers often appraise one thing higher by comparing with another of lesser value. Pedagogical implications are discussed.

この研究では、EFL習熟度ベースの学習者の修辞的な動きに関する要素基準と対話的スタンス（エンゲージメント、変化、および評価）の分布と、応用言語学の出版された要約を調査しました。学習者要約コーパス（Learner Abstract Corpus（LAC））は、台湾の大学院生の制限時間付き要約執筆評価に対する回答からまとめられました。185の要約は、3つのサブコーパス（LASC）に分類されました：低（スコア0–3、LASCの39.15％を占める）、中間（スコア4–5、39.18％）、および高習熟度レベル（スコア6–10、21.67％）。出版済み要約コーパス（PAC）は、6つの有名なジャーナル（各7誌）から編集されました。コーパス間の比較は、主にAntConcプログラムを使用して、特に修辞的な動きと要素標準にタグを付け、評価デバイスを識別するために行われました。結果は、PACと比較した場合、要素標準の誤用、およびLASC全体の動きに対する対話的スタンスの過小使用と過剰使用を明らかにしています。高いレベルの学習者は節間レベルでより対話的なスタンスを表現し、低いレベルは節内レベルでより多く表現しました。結果と結論の動きでは、出版された著者は、主な条項に広範な関与を表明し、評価と変化の機能を展開することでスタンスを維持します。背景と結果の動きでは、出版された著者ははしばしば、価値の低いものと比較することで、物事を高く評価します。教育学的影響について説明します。

Keywords: **ideational element standards, interpersonal dialogistic stance, rhetorical moves, EFL learner abstracts, published abstracts**

Writing English research articles (RA) acceptable to a chosen field is well-known as a key competence of engaging in the global scholastic community (Swales, 1990; Swales & Feak, 2009). Yet, this writing competence poses great difficulties to most English as a second/foreign language (ESL/EFL)

learners (Swales, 1990; Swales & Feak, 2009). EFL/ESL learners can develop this RA writing competence by learning communicative functions (called *moves* by Swales, 1990) and reader engagement of RAs. That is, EFL/ESL learners should master the typical communicative functions and open up a dialogic space via varying linguistic devices conveying the functions, making their RA writing acceptable to their fields (Loi et al., 2016).

Addressing EFL RA writing development, a growing volume of research has described the information structure of RAs from a genre-analyst perspective (Abdollahzadeh, 2011; Lim, 2010). This perspective details how moves of global rhetorical purposes can be realized by local lexico-grammatical patterns. This move-oriented analysis has been applied to RA sections, including the introduction (Chang & Schleppegrell, 2011), method (Lim, 2006), results (Lim, 2010), discussion and conclusion (Abdollahzadeh, 2011), and abstract (Liou et al., 2012; Samar et al., 2014). These sections communicate section-specific information, including an introduction for background to the research questions, method for study context and procedure, results for the collected evidence answering the research questions, and discussion and conclusion for the implications of the research findings. The abstract is viewed as an independent section providing an attractive snapshot of the RA (Swales & Feak, 2009). The abstract, with a word limit, should promote the RA value for inviting RA perusal (Swales & Feak, 2009). This abstract feature poses greater difficulties to ESL/EFL learners (Liou et al., 2012).

While moves in RAs present a generic but sketchy framework in a given discipline, the types of RAs influence details of the move presentation. Taking empirical studies as an example, among the most commonly adopted standards are those of the American Psychological Association (APA, 2008) in social sciences studies. Following this logic, the study mapped the APA reporting standards onto the Swalesian move structure of RA abstracts to analyze the information structure of empirical studies. This study coined the term "element standards" to specify sub-elements of the moves. These element standards largely reflect facts expected to be reported in RAs through the authors' lenses. The professional writers tended to overtly express their perspectives on the facts, and to respect perspectives differing from theirs. Such expressions characterize the dialogistic stance highly expected in RAs (Hood, 2010).

When stating RA highlights, the authors often convey their dialogistic stances via diverse rhetorical approaches (Hood, 2010), and a collection of such dialogistic stances can be made for material for self-paced learning (Chang, 2012) or applications for automatic rating (Cotos, 2014). From the systemic functional linguistics perspective, these approaches may include the expansive approach to encouraging alternative views, the contractive to disclaiming alternatives, the force to adjusting the intensity of the propositions, and the focus to sharpening or softening the proposition (Abdollahzadeh, 2011). The expansive approach refers to entertaining various views and attributing these views to different sources. The contractive approach refers to disclaiming alternative views and proclaiming challenges to the alternative. The force approach denotes quantification (e.g., number, time and space) and intensification of a claim (e.g., quality by degree, process description) (Martin & White, 2005). The focus approach denotes up-scaling for sharpening the claim, and down-scaling for softening it (Martin & White, 2005). Such a dialogistic stance approach is at the clause-based level (Chang, 2012), and enables a more delicate analysis that describes broader linguistic choices for realizing common rhetorical moves at the clause-based/discourse level (Hood, 2010).

This study scrutinized the distribution of element standards of EFL proficiency-based learner RA abstracts in applied linguistics, and the function of dialogistic stances in the learner and published abstracts. Here are the research questions:

1. Are there any misuses of the element standards on the move across the three Learner Abstract Sub-Corpora (i.e., the LASC)?
2. What are the use and functions of dialogistic stances on the move across the LASC and the Published Abstract Corpus? Are there underuses or overuses of dialogistic stances in the LASC?

Literature Review

Genre Analysis on Research Articles

Research article (RA) writing has been one of the most popular topics in the foreign/second language (EFL) research arena over the three decades (Hu & Cao, 2015; Swales, 1990; Swales & Feak, 2009). Mastering RA writing enables EFL learners/non-native-English speakers to navigate their chosen fields. Recent EFL studies have addressed particular sections of RA writing, including abstract (Liou et al., 2012; Samar et al., 2014), introduction (Chang & Schleppegrell, 2011), method (Lim, 2006), results (Lim, 2010), discussion and conclusion (Abdollahzadeh, 2011; Loi et al., 2016), and complete RAs (Chang, & Kuo, 2011). RA abstracts are commonly-known as a miniature RA presenting an attractive snapshot inviting RA perusal (Swales & Feak, 2009). To be a good miniature, RA abstracts should not only summarize key points of the RA, but showcase the highlights. These communicative purposes of RA abstracts often pose greater difficulties to EFL learners with lower writing proficiencies (Chang & Kuo, 2011).

Previous research on genre theory has elucidated the RA writing nature and EFL learners' performance in writing specific RA sections (e.g., abstracts, introductions), thus contributing to a clearer portrait of the EFL development system for RA writing competence (Chang & Kuo, 2011; Liou et al., 2012). Promising though this research trend appears to be, there are a number of nuanced differences in the analytical framework, such as Hyland's metadiscourse (Abdollahzadeh, 2011; Chang & Kuo, 2011; Hyland, 2005), or the evaluation system in systemic functional linguistics (Chang & Schleppegrell, 2011; Loi et al., 2016). The metadiscourse framework has been widely applied in the larger-scale analysis and pedagogical application of EFL RA writing (e.g., Chang & Kuo, 2011). Hu and Cao (2015) quantitatively analyzed the metadiscourse of evaluation in 120 RAs in applied linguistics, education, and psychology. Their results revealed that applied linguistics RAs employed more evaluation and reader references, but fewer self-mentioning than those in psychology (Hu & Cao, 2015). These findings suggest a need to scrutinize evaluation devices in applied linguistics.

Various solid analyses have been conducted on RAs presenting heteroglossic stances and arguing for the propositions intended, including the RA introductions of ESL learner writers (Chang & Schleppegrell, 2011; Hood, 2010), and the RA conclusions of published papers in English and Malay (Loi et al., 2016). RA abstracts have yet to be fully investigated in terms of dialogistic stances, although it is indispensable to use rhetorical approaches of reader engagement and scalable proposition in RA abstracts.

Dialogistic Stance on the Move: Engagement and Graduation

There is a long-held belief that knowledge construction in academia involves not only ideational fact but author-reader interpersonal dialogue (Chang, 2012; Martin & White, 2005). When stating facts, academic writers are expected to take a dialogistic stance that embraces a dialogue with imagined readers taking alternative stances (Hood, 2010).

In Martin and White's (2005) evaluation system, the interpersonal language is defined as "with the subjective presence of writers/speakers in texts as they adopt stances towards both the material they present and those with whom they communicate" (p. 1). The dialogistic stance is defined as "[w]hen viewed dialogistically (rather than from the perspective of a truth-functional semantics, as is often the case), such locutions are seen actively to construe a heteroglossic backdrop for the text by overtly grounding the proposition in the contingent, individual subjectivity of the speaker/writer and thereby recognizing that the proposition is but one among a number of propositions available in the current communicative context" (p. 105).

In constructing a dialogistic stance, the evaluation system subsumes three dimensions: attitude, engagement and graduation in systemic functional linguistics (Martin & White, 2005). Attitude refers

to the affect of positive and negative feelings (affect being found to have fewer occurrences in the research genre by Hood, 2010), judgement of attitude towards behaviors, and appreciation of evaluations of semiotic and natural phenomena. Engagement refers to creating a monologic or dialogic space for argument-building. Graduation denotes quantifying force and addressing the proposition with a particular focus. Within Martin and White's (2005) framework, Hood (2010) details a delicate analysis of the evaluation use of RA introductions, providing a useful framework for the research genre.

EFL Written Learner Corpus for Pedagogy

EFL learner corpora, denoting digital compilations of real texts produced by EFL learners (Granger, 2003), have provided clear insights into EFL writing pedagogy (Cotos, 2014; Granger, 2003, 2012). For instance, analysis of EFL learner corpora enables easier identification of the misuse, overuse, and underuse of the EFL linguistic features (Granger, 2003, 2012). Recent corpus-based studies have gone a step further by aligning key criterial features with each proficiency level to detail progressive change in EFL learners' language competence, signaling directions for digital learning support (Cotos, 2014).

Previous studies have indicated great benefits of using learner corpora to enhance EFL writing pedagogy (Chang, 2012; Chapelle et al., 2015; Cotos, 2014; Granger, 2012). Cotos (2014) specified the effectiveness of genre-based automated writing evaluation (AWE) that provides immediate feedback on the types and qualities of rhetorical moves in EFL learners' RAs to guide a refined revision. Likewise, Chapelle et al. (2015) implemented a diagnosis measure of RA introduction writing with 105 EFL graduate students, alongside automated feedback on the "discourse pattern and linguistic conventions" rather than "writing errors" (p. 12). They found that the EFL graduate students tended to revise their writing at the discursive level rather than at the lexico-grammatical level, and were capable of expressing better meaning-construal in RA writing. These studies demonstrate smart applications of computerized tools that adopted a corpus-based approach to evaluating changes in EFL RA writing over drafts. They provide insights into progressive change in EFL RA writing, and practical guidance for better quality EFL RA writing. Corpus-based research efforts to improve EFL RA writing competence are worth making, particularly for achieving a common goal of enhancing EFL RA writing instruction and materials development (Chang, 2012).

Several EFL learner corpora of RA writing have been constructed in Taiwan, including RAs (Chang & Kuo, 2011) and RA-abstracts (Liou et al., 2012). Liou et al. (2012) compiled a reference corpus comprising research abstracts across disciplines from the Web in developing a writing-aid system for EFL learners. Liou et al. (2012) presented a feasible model of translating corpus data into teaching materials. Chang (2012) developed effective online instructional materials for an engagement system in RA introductions, according to EFL learners' perceptions. These findings demonstrate the great potential of harnessing computerized tools to enhance EFL RA writing.

These RA-related learner corpora have revealed the underlying structures of EFL learners' RAs. It remains relatively unknown whether there is a systematic alignment of critical language features with EFL learners' proficiency level. This study aligned EFL learners' proficiency-based abstracts with respective uses of element standards and dialogistic stances, in comparison with a reference corpus.

Method

The Corpus-based CDA and the *AntConc* Concordancer

The corpus-based critical discourse analysis (CDA) approach has been widely adopted to analyze text features and functions of discourse through a critical and context-laden lens (Mautner, 2015; Nartey & Mwinlaaru, 2019). By adopting this approach, systemic functional linguistics is one of the

popular theoretical or conceptual frameworks in analysis, since the approach provides quantitative frequency of the investigated lexico-grammatical patterns or text features, and qualitative in-depth interpretations of the pattern or feature functions in context (Nartey & Mwinlaaru, 2019). Particularly, the approach can be easily applied using the computerized database and concordancers (Nartey & Mwinlaaru, 2019). Following this logical vein, the study employed the freeware *AntConc* 3.5.8 program to concordance the potential words and lexico-grammatical patterns in research abstracts, to tag the element standards on the moves, and to identify evaluation devices when identifying the dialogistic stance on the move across research abstract corpora.

In fact, the use of the *AntConc* program accelerated the procedure of gathering both the quantitative and qualitative evidence from learner sub-corpora and a reference expert corpus (Granger, 2012). Quantitatively, the program generates both the frequency-based wordlists revealing the general tendency of word choices across corpora, and keyword lists revealing the specificity of a particular learner sub-corpus (sometimes being the overuse or misuse of the lexico-grammatical patterns of EFL/L2 learners; Granger, 2012). Compared to manual discourse analysis, the program enables a computerized database including a larger volume of corpora to facilitate more systematic and complex cross-corpus comparison (Granger, 2012; Mautner, 2015). Qualitatively, the program allows for an individual inquiry on each word of the list over clauses, so that the semantic-discourse preference or prosody (Mautner, 2015; Nartey & Mwinlaaru, 2019) of the word can be revealed.

In a nutshell, the corpus-based CDA approach was taken using the *AntConc* program. The approach can allow quantitative and qualitative comparison of the text features and functions of the learner and expert research abstracts using the evaluation framework on the rhetorical moves. The corpora and the analysis framework are subsequently detailed.

The Corpora

Learner Abstract Sub-Corpora

The Learner Abstract Corpus (the LAC) was compiled from 185 English abstracts (amounting to 34,274 words) written in response to a prompt in Chinese. The abstracts were rated by two raters using two scales (i.e., the global move and the local pattern; Lin et al., 2015), giving a total score of writing quality (ranging from 1 to 10). The distribution of scores was frequency-analyzed, and the LAC was classified into three proficiency-based sub-corpora, called the LASC, which included the low (76 abstracts scored 0–3 with 13,549 words, accounting for 41 % of the LASC), the intermediate (71 abstracts scored 4–5 with 13,562 words, 39%), and the high (38 abstracts scored 6–10 with 7,501 words, 20%).

The *AntConc* 3.5.8 program was mainly employed to tag moves and element standards, and to identify evaluation devices. First, using the program to concordance the potential words indicating the moves (e.g., *the study, results, findings, show, participants, pedagogical,* etc.), the LASC were move-tagged by two researchers in applied linguistics. In terms of the move-tagging results, there was a satisfactory inter-coder reliability of 0.95. Similarly, the concordance procedure was applied to identify element standards in the learner corpora. Finally, the evaluation devices were coded by three researchers who used the *AntConc* program to generate a keyword list for each LASC with a reference corpus of the published abstract corpus. The key words were then concordanced to identify the potential words or lexico-grammatical patterns expressing dialogistic stances on the move (e.g., *despite, show, indicate, effectiveness, comprehension, skill, promising, important,* etc.). In terms of the evaluation device-identifying results, there was a 0.92 satisfactory inter-coder reliability.

Published Abstract Corpus

The Published Abstract Corpus (the PAC) was compiled from abstracts of six prestigious international journals, including *RECALL, Computer Assisted Language Learning, Language Learning & Technology, the International Journal of Corpus Linguistics, the Journal of English for Academic Purposes,* and *Written Communication* published from 2010 through 2016. These abstracts included seven from each journal, totaling 7,963 words (see Appendix for a list of PAC articles cited in this paper).

The first three journals were chosen for their focus on computer-assisted language learning which was the topic of the writing prompt. The others were chosen for their focus on ESL/EFL writing research. The dual foci were related to the writing prompt of the learner abstracts.

Move Tagging and Element Standards

Table 1 reports rhetorical moves in abstracts, including moves of the purposes of providing background (B), indicating purposes or tasks of the study (P), describing methods or theories (M), reporting results (R), and making conclusions and evaluations (C). Table 1 also details element standards extracted from the prompt by the APA (2008) reporting standards of journal articles.

Analysis Framework

In the analysis, the study mapped dialogistic stances onto the rhetorical moves of the Swalesian move framework of RA abstracts (Chang & Schleppegrell, 2011). The study adopted Martin and White's (2005) engagement system in appraisal for general writing, shown in Figure 1, and Hood's (2010) graduation system for the RA introductions in Figure 2.

Figure 1

The System of Engagement in Appraisal (Adapted from Martin & White, 2005)

Engagement
- contract
  - disclaim
    - deny (no, didn't, never)
    - counter (yet, although, amazingly, but)
  - proclaim
    - concur
      - affirm (naturally, obviously, etc)
      - concede (admittedly…(but); sure…[however] etc)
    - pronounce (I contend, the facts of the matter are, indeed)
    - endorse (the report demonstrates/shows/proves)
- expand
  - entertain (perhaps, it's probable that, that may be, must, it seems to me, apparently, expository questions)
  - attribute
    - acknowledge (Halliday argues that, many Australian believe that, it's said that, the report states)
    - distance (Chomsky claimed to have shown that)

Figure 2

    The Graduation Network (Adapted from Hood, 2010)

```
                              ┌ intensifying ┌ an attribute
                              │              ├ a process
              ┌ Force         │              └ a proposal
              │               │
              │               └ quantifying ┌ a thing
                                            │                                        ┌ space
Graduation ┤                                │              ┌ extent   ┌ distance ─ └ time
              │                             └ a process ─┤             │                   ┌ space
              │            enhancement                     └ frequency └ scope ─ └ time
              │
              │
              └ Focus       ┌ valeur      ┌ authenticity
                            │             └ specificity
                            │
                            └ fulfillment ┌ completion
                                          └ actualization
```
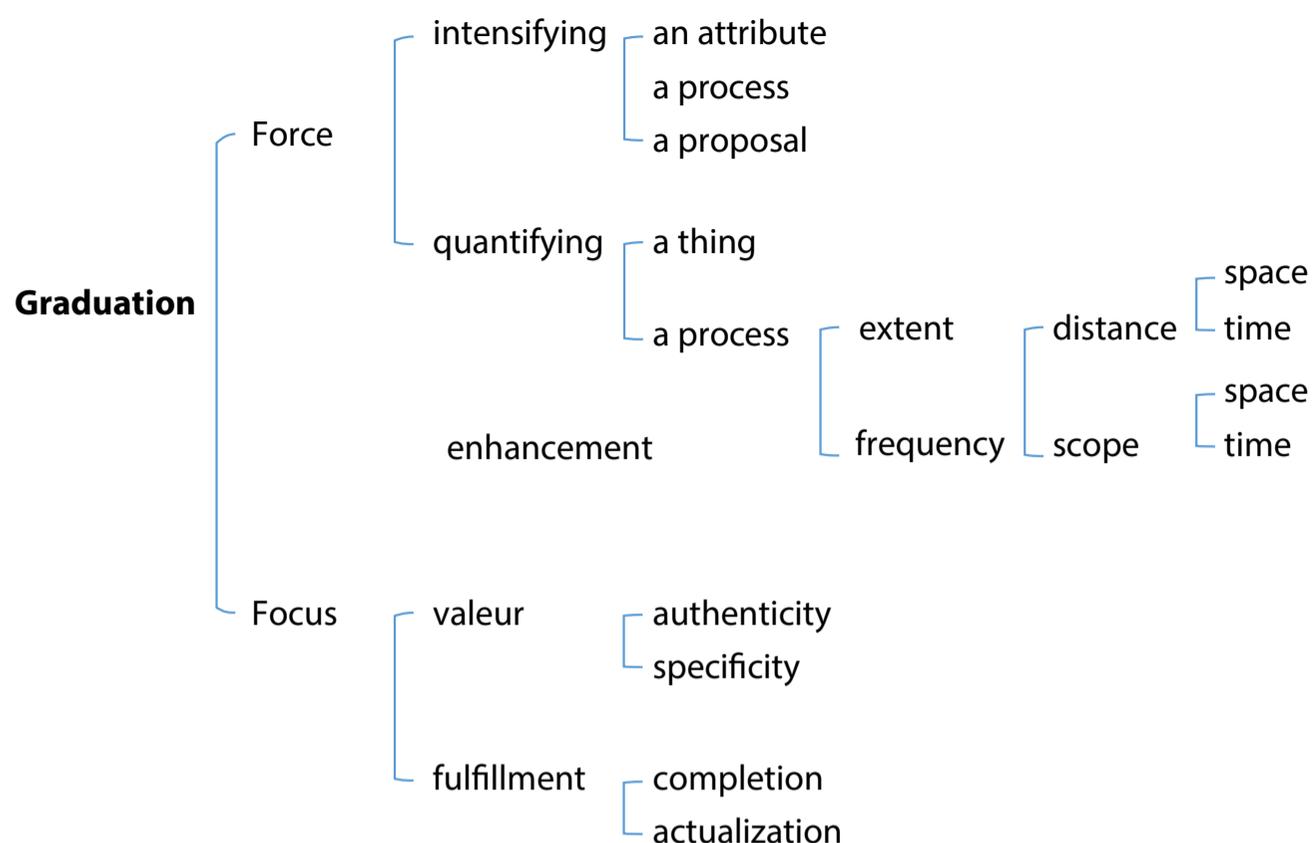
In the research genre, attitude expressions have been found to use the categories of judgment and appreciation, with fewer affect expressions (Hood, 2010). The study adapted Hood's categories and examples below.

> **Judgment: capacity (**language-related development, knowledge, learning motivation**).**

> **Appreciation: (a) composition/complexity (**the properties of an object in a neutral way**); (b) valuation (**explicit positive/negative appraisals of objects, events, or phenomena**); (c) reaction: (**fewer occurrences in the research genre, and negligible**).**

The study analysis focuses on judgement and appreciation. Judgement denotes perceived capacity or motivation development, and knowledge acquisition. Analyzing the LASC abstracts, judgement was often coded as EFL/ESL learners' self-report on their English learning progression.

The coding was conducted using the three frameworks. First, the two corpora were analyzed using the *AntConc* program to concordance potential evaluation devices that were then examined. In particular, a number of the *AntConc* program functions were performed to search for frequencies and functions of the potential use of evaluation devices. For example, the word lists and keyword lists were searched to identity the higher-frequency words in each LASC. On the basis of the lists, dialogistic stances were examined across abstracts to identify the semantic-discourse functions of the devices (Chang, 2012). Second, the use of engagement was identified by main clauses or subordinate clauses (i.e., the finite). Once an engagement use was identified, the other two uses of evaluative stance may sometimes be overlooked, particularly for those on the adjunct or prepositional phrases. Third, attitude use was examined. Finally, the use of graduation in the two corpora was examined to identify how they expressed force and focus devices to reinforce the evaluation and appreciation. This identification is conducive to unveiling a clearer picture of how the engagement devices are interrelated for a coherent appraisal of dialogistic stance (Hood, 2010).

Results and Discussion

Misuse of Element Standards Across the LASC

Table 1 reports ranks of the misuse of element standards, including the participant numbers over the 3 years on the method move ranked first, and the improved reading and writing ability on the results ranked second.

Table 1

Rank of the Most Misuses of the Content Elements on the Moves in the LASC

Move: Element standards	Rank
M1: Participants included 41 college students majoring in applied English in 2003, 35 students respectively in 2004 and 2005	1
R3: Their English reading and writing ability improved	2
R1: Learners' positive perceptions of asynchronous discussion	3
R2: Learners indicated that their comprehension of the course content was facilitated	4
M2: Collected data include discussion exchanges, 5-point Likert scale questionnaires, and group interviews	5
P: The effects of implementing text-based asynchronous discussion in one content-based English course	6

Underuse, Overuse, and Function of Dialogistic Stances

Results Across the PAC and the LASC

The results indicated that dialogistic stances were found to be more likely on the results, conclusion, background, and purpose moves (arranged by frequency), corresponding to previous studies (Loi et al., 2016).

Table 2 reports the dialogistic stances in the PAC and the LASC-H. The PAC had 403 occurrences of the dialogistic stances, including 130 of the engagement amounting to 32.26%, 141 of the attitude 34.99%, and 132 of graduation 32.75%. Of all the moves, the results move was found to have the highest distributions of evaluation devices, 188.37 counts per 10,000 words, following the conclusion and purpose, 105.49 and 72.84 counts. These moves provide a snapshot of the corresponding RA sections including more evaluation devices (Loi et al., 2016).

Table 2

Dialogistic Stances Across the PAC and the LASC-H

PAC %(count)	B	P	M	R	C	Total
Engagement	30.36(17)	13.79(8)	27.27(15)	**40.00(60)**	**35.71(30)**	32.26 (130)
Attitude	**39.28(22)**	34.48(20)	32.72(18)	34.00(51)	**35.71(30)**	34.99 (141)
Graduation	30.36(17)	**51.72(30)**	**40.00(22)**	26.00(39)	28.57(24)	32.75 (132)
Ratio of the dialogistic stance on the move	2.3 (46/20)	1.38 (58/42)	1.31 (55/42)	**3.57** (150/42)	2.55 (84/33)	
Count per 10,000 words	57.77 (46/7,963) *10,000	72.84 (58/7,963) *10,000	69.07 (55/7,963) *10,000	**188.37** (150//7,963) *10,000	105.49 (84/7,963) *10,000	493.53 (393/7,963) *10,000

LASC-H %(count)	B	P	M	R	C	
Engagement	24.62(16)	46.15(18)	23.53(4)	32.47(50)	25.81(16)	30.86(104)
Attitude	**46.15(30)**	**48.72(19)**	**41.18(7)**	**46.75(72)**	**48.39(30)**	46.88(158)
Graduation	29.23(19)	05.13(2)	35.29(6)	20.78(32)	25.81(16)	22.26(75)
Ratio of the dialogistic stance on the move	3.25 (65/20)	1.03 (39/38)	0.46 (17/37)	**4.05** (154/38)	2.14 (62/29)	
Count per 10,000 words	86.66 (65/7,501) *10,000	51.99 (39/7,501) *10,000	22.66 (17/7,501) *10,000	**205.31** (154/7,501) *10,000	82.66 (62/7,501) *10,000	449.27 (337/7,501) *10,000

Note. Bolded numbers are the higher occurrences.

The LASC-H included 337 occurrences of the dialogistic stances, including 104 of the engagement amounting to 30.86%, 158 of the attitude 46.88%, and 75 of graduation 22.26%. The results move had the highest distributions of the evaluation devices, 205.31 counts per 10,000 words, following the background and conclusion with 86.66 and 82.66 counts.

Table 3 reports the dialogistic stances in the LASC-I and LASC-L. The LASC-I included 559 occurrences of the dialogistic stances, including 157 of the engagement amounting to 28.09%, 288 of the attitude 51.52%, and 114 of graduation 20.39%. Across moves, the results move had the highest distributions of the evaluation devices, 170.33 counts per 10,000 words, followed by the background and purpose with 114.29 and 46.45 counts.

The LASC-L comprised 499 occurrences of the dialogistic stances, including 147 of the engagement amounting to 29.46%, 233 of the attitude 46.69%, and 119 of graduation 23.85%. The results move had the highest distributions, 135.07 counts per 10,000 words, followed by the background and conclusion with 128.42 and 42.07 counts.

Table 3

Dialogistic Stances Across the LASC-I and LASC-L

LASC-I %(count)	B	P	M	R	C	Total
Engagement	25.16(39)	**46.03(29)**	18.52(10)	29.87(69)	17.86(10)	28.09 (157)
Attitude	**49.03(76)**	44.44(28)	**53.70(29)**	**51.95(120)**	**62.50(35)**	51.52 (288)
Graduation	25.81(40)	09.52(6)	27.78(15)	18.18(42)	19.64(11)	20.39 (114)
Ratio of the dialogistic stance on the move	3.16 (155/49)	0.91 (63/69)	0.79 (54/68)	**3.50** (231/66)	1.56 (56/36)	
Count per 10,000 words	114.29 (155/13;562) *10,000	46.45 (63/13;562) *10,000	39.82 (54/13;562) *10,000	**170.33** (231/13;562) *10,000	41.29 (56/13;562) *10,000	526.47 (559/13;562) *10,000
LASC-L %(count)	B	P	M	R	C	
Engagement	30.46(53)	**58.82(20)**	13.72(7)	27.32(50)	29.82(17)	29.46 (147)
Attitude	**41.95(73)**	38.24(13)	**49.02(25)**	**50.82(93)**	**50.88(29)**	46.69 (233)
Graduation	27.59(48)	02.94(1)	37.25(19)	21.86(40)	19.30(11)	23.85 (119)
Ratio of the dialogistic stance on the move	3.18 (174/55)	0.56 (34/61)	0.77 (51/66)	**3.27** (183/56)	1.90 (57/30)	
Count per 10,000 words	128.42 (174/13;549) *10,000	25.09 (34/13;549) *10,000	37.64 (51/13;549) *10,000	**135.07** (183/13;549) *10,000	42.07 (57/13;549) *10,000	368.29 (499/13;549) *10,000

Note. Bolded numbers are the higher occurrences.

There are similarities and differences across the sub-corpora. Concerning the similarities, these sub-corpora included the most dialogistic stances on the results move (the highest occurrences of attitude). Concerning the differences, the LASC-I revealed the second and third most dialogistic stances

on the background (the highest of attitude) and the purpose (the highest of engagement). The LASC-L revealed more attitude stances on the background and conclusion.

Underuse and Overuse of the Dialogistic Stances Across the LASC

The PAC revealed the most dialogistic stances on the results move (the highest occurrences of engagement), following the conclusion (the highest of engagement and attitude) and the purpose (the highest of graduation). The LASC-H revealed the most dialogistic stances of attitude on the results, following the background and conclusion.

Across the three LASC, the highest occurrences of the dialogistic stances were found to be attitude devices of judgement. The EFL learner writers often stated the targeted language performance or learning perception in the evaluation framework.

There are cross-corpus differences in the dialogistic stances. The differences were on the purpose, method, and result moves. On the purpose move, the PAC had more graduation devices but fewer engagement devices. The LASC had more expansive approaches of engagement devices. On the method, the PAC used more graduation devices but fewer engagement devices. On the results, the PAC used more engagement devices; the three LASC used more attitude devices.

Against the backdrop of dialogistic stances in the PAC, the differences may indicate potential underuse and overuse of dialogistic stances in the LASC. The LASC revealed the underuse of factual statements (monogloss) and graduation devices in stating research purposes, and the underuse of engagement devices in stating results and conclusion. The LASC overused engagement on research purposes, and attitude on method and results. These findings support previous studies which found that EFL/ESL learner writers have yet to master engagement use in RA writing (Chang, 2012; Hood, 2010).

Distribution of the Dialogistic Stance in the PAC

On the background move, the writer stated the increasing use of a program, and indicated a lack of learners' perceptions of the program. The writer then specified the study aim for learners' perceptions.

/B/:**Despite** the availability and *growing use* of digital story software for authoring and instructional purposes *[+force: quantifying a process/extent]* **[contractive: disclaim/counter]**, *little is known* about learners' perceptions on its integration in the foreign language writing class. *[-force: quantifying a thing]* /P/Following both a social semiotics approach and activity theory, this study focuses on *six* advanced Spanish learners' perceptions about the production of a digital story in which they integrated *a variety of modes* (written, oral, images, sounds) *[+force: quantifying a thing]* and manipulated the semiotic resources within *each mode* (size, color, lines in the image mode), to convey meaning. (Oskoz & Elola, 2016)

The Stances Being Effectively Conveyed Over Clauses

On the results move, the expansive approach was often found, suggesting a norm that acknowledges facts and lets the evidence speak for itself in reporting RA results (Chang & Kuo, 2011). Using this expansive approach, the published writers deployed a series of attitude and graduation devices when promoting the results value, consistent with Chang and Schleppegrell's (2011) findings.

The expansive that-clause was found to express positive evaluation of the participants or objects via a greater appreciation, or judgement of better behavior/disposition.

/R/**Further analysis by stakeholder indicated** that *perceptions varied to a certain extent across* stakeholder groups. *[+force: quantifying a process/extent]* **[expansive: attribute/acknowledge]** **The results** *also* **indicated** that *various factors [+force: quantifying a thing]* were **recognized as** <u>contributing to</u>

[+appreciation: valuation] an academic test's global perception. **[expansive: attribute/acknowledge]**. (Lin & Youngsoon, 2015)

On the conclusion, the expansive approach often stated study contributions with respect for alternative views.

/C/ **These findings suggest** that full rather than keyword captioning [+appreciation: valuation] contrast **should be considered** when proposing video-based listening comprehension activities to L2 learners. **[expansive: entertain]** (Montero-Perez et al., 2014)

On the conclusion, monologue was used for stating study implications, with stronger force on an explicitly stated preferred feature/phenomenon.

/C/These findings have important implications for understanding the construct of speaking proficiency and for the development of automatic scoring techniques. [+appreciation: valuation] (Crossley & McNamara, 2013)

Typical Use of the Dialogistic Stance in the PAC

On the purpose and method moves, the published writers often expressed monologue, and positive composition or valuation of preferred features. On the result, the writers often adopted the expansive approach to attributing the results to the facts, alongside force or focus devices of quantifiers. On the conclusion, the writers positively appraised those features by expansive or contractive approaches.

/B/**Research has shown** that novice writers tend to ignore opposing viewpoints [–judgment: competence] when framing and developing arguments in writing, a phenomenon *commonly referred to* as my-side bias *[+force: quantifying a thing: frequency]*[–appreciation: valuation] **[contractive: proclaim/ endorse]**. /P+M/ In the present article, **we** contrast two forms of argumentative discourse conditions (arguing to persuade and arguing to reach consensus) and examine their *differential effects on my-side bias* in writing. *[+force: quantifying: a process/scope]* contrast. /R/**Our data reveal that** when asked to write an essay to support their opinions on capital punishment, individuals who had argued to reach consensus were more likely to cite claims that challenge their position, reconcile these claims with their position, and make use of claims that had originally been introduced by their dialogue partners. [+judgement: competence]**[expansive: attribute/acknowledge]**/C/**We discuss these findings** in light of educational policy and practice and caution against an overemphasis on using persuasive discourse as a means of teaching argumentative reasoning and writing. [–appreciation: valuation] **[expansive: entertain]** (Felton & Crowell, 2015)

The published writer expressed a consistent contrast (i.e., arguing to reach consensus being more learnable than arguing to include opposing viewpoints than arguing to persuade) throughout the abstract. On the background move, the writer first defined my-side bias. On the purpose and method, the writer examined the bias effect on two argumentative types. On the results and conclusion, the writer assigned higher appraisal to the essay arguing for consensus to encourage greater inclusion of opposing viewpoints, and issued a caution regarding educational policy.

Frequent Use of the Dialogistic Stances in the LASC

Below are the typical dialogistic stances on the moves in the LASC. On the purpose, the expansive approach was often used to entertain alternative views.

/P+M/The present study **aims to investigate** the influence of asynchronous discussion on the content-based English-learning course for three groups of senior university students who have taken the course in 2003–2005. **[expansive: entertain]** [LASC-L1]

On the results, the contractive approach, and positive valuation were often adopted.

/R/**From the data collected, it is shown** that *about 50%* of the students are fond of [+judgment: disposition] the system and *most* of the students *[+force: freq]* agree that the system is suitable for

[+appreciation: valuation] the class and facilitates their understanding of the class as well as their language competence. [+appreciation: valuation] **[contractive: proclaim/endorse] It is** *also [+force: quantifying a process/extent]* **shown that** the more students participate and interact in the system, *the greater* the effects of the system are. *[+force: quantifying: a thing]* **[contractive: proclaim/endorse]** [LASC-I4]

On the conclusion, the higher level learner writers were found to use both the contractive approach and monologue when stating the potential study value.

/C/**The** promising **results** thus **encourage** the adoption of non-simultaneous in instruction. [+appreciation: valuation] **[contractive: proclaim/pronounce]** [LASC-I2]

The lower level writers stated no significant difference between the study design and conventional language teaching and made no elaborations on the results move. This sketched comparison makes less explicit the inter-related and intended contrast throughout an abstract.

/B/In the era of globalization, **English has become** a lingua franca. Many EFL and ESL learners eager to learn English well **[contractive: proclaim/endorse]**. Nowadays, thanks to high technology, it changes the site on language teaching. Asynchronous discussion **is broadly used** on the Internet teaching to *various courses [+force: quantifying: a thing]* **[contractive: proclaim/endorse].** According to many reports, they claimed that by asynchronous discussion, a kind of on-line discussion system without time and space limitation [+appreciation: valuation], students can cooperate with each other, sharing and learning their experience and knowledge to progress their thinking level. In this way, students are willing to learn automatically to build up their knowledge and do critical thinking of learning process. [+judgement: motivation] Therefore, asynchronous discussion is the case study in language teaching. It *not only* let students use target language successfully in reality to enhance their oral ability, *but also* let students learn more meaningful knowledge through critical thinking and discussion. *[+force: quantifying a process]* [+judgement: knowledge]/P+M/Based on this, the study **aims to discover** the effect and influence through asynchronous discussion applied in content-based courses on English for Specific Purpose in university. **[expansive: entertaining]** /M/The study last three years, /R/**it was shown** that there was **no** significant difference compared to conventional language teaching. [-appreciation: valuation] **[contractive: proclaim/endorse]** /C/**However,** asynchronous discussion **does open** a mile stone on language teaching and inspire scholars to do further study in the future. [+appreciation: composition] **[contractive: proclaim/counter]** [LASC-L123]

The results indicated that the EFL learners included evaluation stances on the results, conclusion, and purpose moves. The higher-level learners usually expressed dialogistic stances at the inter-clause and discourse-semantic level. The lower level learners expressed more at the intra-clause level, and their use of dialogistic stances was less inter-related in discourse, consistent with previous studies (Chang & Schleppegrell, 2011; Hood, 2010).

On the results and conclusion moves, the published writers often expressed expansive engagement in main clauses, and maintained their stances by deploying appreciation and graduation devices in the following clauses. On the background and results, the published writers usually appraised one thing higher than the other, supporting Hood's statement (2010) that inscribed evaluation reveals a preferred statement by a less direct cross-object comparison.

Typical Dialogistic Stances across the Two Corpora

Table 4 details the typical dialogistic stances.

Table 4

The Typical Dialogistic Stances

The PAC Moves/ Discursive Stance (DS)	Engagement options	Linguistic devices [examples]
Background-assigning values for the research topic.	1.1 Expansive: Entertain diverse perspectives on the topic. 2.1 Contractive: Proclaim/endorse the topic importance. 1.2&2.2+Appreciation: Valuation.	1.1 The finite using the present perfect tense: [*the research has indicated/revealed*] 2.1 The finite of more certainty: [*the research has shown/demonstrated*] 1.2&2.2 Adjectives; nouns; verbs [*major, useful, powerful; effectiveness, success; enhance, increase*]
Background-stating gap/challenge.	1.1 Contractive: Disclaim/counter the proposition. 1.2−Appreciation: Composition. 2.1 Contractive: Disclaim/deny the proposition. 2.2−Appreciated: Valuation.	1.1 Conjunction of contrast [*despite, however*] 1.2 Adjectives [*challenging, traditional*] 2.1 Negation [*not, never*] 2.2 Adjectives [*limited, disadvantaged, difficult*]
Purpose	1.1 Factual/monogloss. 1.2+Appreciation: Composition denoting preferred features/people and reinforcing them in the subsequent discourse. 1.3 Graduation: +focus denoting specificity.	1.1 The finite [*the study examined/investigated…*] 1.2 Nouns; adjectives [*difference; innovative*] 1.3 Adjectives; nouns [*particular, specific; focus*]
Method	1.1 Factual/monogloss. 1.2 Graduation: +force quantifying a process with a wider extent 1.3 Graduation: +force intensifying a process.	 1.2 Quantifiers [four *different* types] 1.3 Quantifiers [*highly*]
Results	1.1 Expansive: Attribute/acknowledge the importance of evidence to the results. 1.2+Appreciation: Valuation. 1.3+Judgement of good behavior/disposition. 1.4+Force: Quantifying a thing/process. 1.5+Force: Frequency. 1.6+Focus on specificity/authenticity. 2.1 Contractive: Disclaim/counter the proposed hypothesis.	1.1 The finite [*the results indicate/ suggest/ reveal*] 1.2 Adjectives; nouns; verbs [*significant, successful; development, willingness; enhance*] 1.3 Adjectives; nouns; verbs [*self-regulated; autonomy; outperform*] 1.4 Adjectives, adverbs [*highly*] 1.5 Adverbs [*widely*] 1.6 Adjectives; adverbs [*specific; rather*] 2.1 Negation [*not, none*]
Conclusion	1.1 Contractive: Proclaim/pronounce. 2.1 Expansive: Entertain. 1.2& 2.2+Appreciation: Valuation.	1.1 The finite of more certainty [*demonstrate/ contribute to*] 2.1 The finite indicating tentativeness [*the findings suggest*] 1.2&2.2 Adjectives/nouns [*beneficial; merit*]

The LASC Moves/ Discursive Stance (DS)	Engagement option	Linguistic devices[examples]
Background-assigning values for the research topic.	1.1 Expansive: Entertain various perspectives on the topic. 2.1 Contractive: Proclaim/endorse the topic importance. 1.2&2.2+Appreciation: Valuation of a preferred feature.	1.1 The finite using the present perfect [*the studies indicate/reveal*] 2.1 The finite of more certainty [*English has become*] 1.2&2.2 Adjectives; nouns; verbs [*meaningful, useful; effectiveness, development; benefit*]
Background-stating gaps/ challenges.	1.1 Contractive: Disclaim/counter the proposition. 1.2 Appreciation: Composition. 2.1 Contractive: Disclaim/deny the proposition. 2.2–Appreciated: Valuation	1.1 Conjunction of contrast [*despite, however*] 1.2 Adjectives [*little, traditional*] 2.1 Negation [*not, never*] 2.2 Adjectives [difficult, inconsistent]
Purpose	1.1 Expansive: Entertain. 1.2+Appreciation: Composition denoting preferred features. 1.3 Graduation: +focus denoting specificity.	1.1 The finite [*the study aims to*] 1.2 Nouns [*the effects/impact*]
Method	Factual/monogloss.	
Results	1.1Contractive: Proclaim/endorse importance of the results. 2.1 Expansive: Attribute/acknowledge the importance of evidence to the results. 1.2&2.2+Appreciated: Valuation. 1.3&2.3+Judgement of good behavior/disposition. 2.1 Contractive: Disclaim/counter the hypothesis.	1.1 The finite reporting with more certainty [*The result/research shows*] 2.1 The finite of tentativeness [*results revealed/ indicated*] 1.2&2.2 Adjectives; nouns; verbs [*significant, positive; development, willingness; enhance, benefit*] 1.3&2.3 Adjective; verbs [*improved, positive; agree, promote, develop*] 2.1 Negation [*not*]
Conclusion	1.1 Contractive: Proclaim/pronounce value of the findings. 2.1 Expansive: Entertain alternative viewpoints. 1.2&2.2+Appreciated: Valuation.	1.1 The finite of more certainty [*The study demonstrated; the research sheds light*] 2.1 The finite indicating tentativeness [*the results yield suggestions*] 1.2&2.2 Adjectives; nouns [*effective; autonomy*]

Note. +: denoting positive, -: negative. The engagement approaches were arranged by frequency.

In brief, the PAC often deployed a series of evaluation devices across moves in abstracts; the LASC did so occasionally. The PAC included more expansive approaches on the results and conclusion, but more factual on the purpose and conclusion. Numerous appreciation and graduation devices are deployed to propagate the value. The LASC seldom included multiple evaluation devices across moves for an intended value.

Conclusion

The study reveals the misuse of element standards, and the underuse and overuse of dialogistic stances on the moves across the three LASC when compared with the PAC. The PAC indicates a clear

pattern of using contrast rhetoric throughout an abstract. The LASC indicates the less-developed use of contrast. These differences suggest that EFL graduate students should learn to deploy multiple linguistic devices for greater engagement in a research community.

The study reveals a variation in EFL learners of three proficiency levels being capable of expressing ideational and interpersonal meanings in RA abstracts. Analyzing the RA abstracts, this study details a multi-staged, though not exhaustive, picture of how EFL learners at varying levels are competent in adopting multiple linguistic recourses to express the expected ideational content and the appropriate interpersonal engagement.

In terms of the methodical implications, the findings support that it is feasible to take the corpus-based CDA approach using the freeware concordancers to compare a few annotated corpora, and then to identify the nuanced function differences in the designated linguistic devices in discourse across corpora (Mautner, 2015; Nartey & Mwinlaaru, 2019).

Particularly, the cross-corpus comparison is more easily performed using the concordance and keyword list functions to locate the intended lexico-grammatical patterns across corpora against the backdrop of the rhetorical moves at the macrostructure level. Thanks to the freeware concordancer (i.e., the *AntConc* 3.5.8 program in this study), it is possible to conduct sophisticated annotation, extraction, and analysis of the cross-corpus data in an efficient and user-friendly manner (Granger, 2012; Nartey & Mwinlaaru, 2019), rather than performing the analysis via a laborious, costly, and manual approach. This efficient use of the freeware concordancer engenders widespread application of learner corpora for EFL writing research.

In terms of pedagogical implications, this multi-staged development of EFL RA writing indicates potential applications for automatic scoring of RA writing, RA writing material development based on the learner and expert corpora (Cotos, 2014), and self-learning resources for EFL learners (Chang, 2012; Granger, 2012). In fact, the EFL proficiency-based learner corpora are a component essential for developing automated writing evaluation systems, since they can serve as training data for grading as well as a database for calibrating the learners' writing performance by English proficiency or the lexico-grammatical patterns in question (Chapelle et al., 2015; Cotos, 2014). Likewise, the EFL proficiency-based learner corpora and expert corpus can serve as an online built-in specialized corpus to support the self-paced learning of EFL graduate students in tackling the daunting task of writing RAs. In fact, this application of specialized corpora is found to be conducive to EFL learners' sharpening of both the skills of noticing and producing dialogistic stances in RA introductions and of writing better RA introductions in Chang (2012). Apparently, the use of specialized corpora has greater pedagogical potential for increasing English learners' language sensitivity of given lexico-grammatical patterns and text features when designed into a constructive environment in which learners can observe the occurrences of lexico-grammatical patterns and text features in context and make inductions about the patterns and features (Sinclair, 2003). Accordingly, EFL learners are more likely to master the free production of semantic-discourse functions of the patterns and features under study.

Acknowledgment

References

Abdollahzadeh, E. (2011). Poring over the findings: Interpersonal authorial engagement in applied linguistics papers. *Journal of Pragmatics, 43*, 288–297.

American Psychological Association Publications and Communications Board Working Group on Journal Article Reporting Standards. (2008). Reporting standards for research in psychology: Why do we need them? What might they be? *American Psychologist, 63*, 839–851.

Anthony, L. (2019). AntConc (Version 3.5.8) [Computer Software]. Waseda University. **http://www.antlab.sci.waseda.ac.jp/**

Chang, C. F., & Kuo, C. H. (2011). A corpus-based approach to online materials development for writing research articles. *English for Specific Purposes, 30*(3), 222–234.

Chang, P. (2012). Using a stance corpus to learn about effective authorial stance-taking: A textlinguistic approach. *ReCALL, 24*(2), 209–236.

Chang, P., & Schleppegrell, M. (2011). Taking an effective dialogistic stance in academic writing: Making the linguistic resources explicit for L2 writers in the social sciences. *Journal of English for Academic Purposes, 10*, 140–151.

Chapelle, C. A., Cotos, E., & Lee, J. (2015). Validity arguments for diagnostic assessment using automated writing evaluation. *Language Testing, (Special Issue)*, 1–21.

Cotos, E. (2014). *Genre-based automated writing evaluation for L2 research writing: From design to evaluation and enhancement.* Palgrave Macmillan.

Crossley, S., & McNamara, D. (2013). Applications of text analysis tools for spoken response grading. *Language Learning & Technology, 17*(2), 171–192. **http://llt.msu.edu/issues/june2013/crossleymcnamara.pdf**.

Felton, M., & Crowell, A. (2015). Arguing to agree: Mitigating my-side bias through consensus-seeking dialogue. *Written Communication, 32*(3), 317–331. **https://doi.org/10.1177/0741088315590788**.

Granger, S. (2003). The international corpus of learner English: A new resource for foreign language learning and teaching and second language acquisition research. TESOL Quarterly, 37(3), 538–546.

Granger, S. (2012). How to use foreign and second language learner corpora. In A. Mackey & S. M. Gass (Eds.), *Research methods in second language acquisition: A practical guide* (pp. 7–29). Wiley-Blackwell. **https://doi.org/10.1002/9781444347340.ch2**

Hood, S. (2010). *Appraising research: Evaluation in academic writing.* Palgrave Macmillan.

Hu, G. W., & Cao, F. (2015). Disciplinary and paradigmatic influences on interactional metadiscourse in research articles. *English for Specific Purposes, 39*, 12–25.

Hyland, K. (2005). *Metadiscourse: Exploring interaction in writing.* Continuum.

Lim, J. M. H. (2006). Method sections of management research articles: A pedagogically motivated qualitative study. *English for Specific Purposes, 25*, 282–309.

Lim, J. M. H. (2010). Commenting on research results in applied linguistics and education: A comparative genre-based investigation. *Journal of English for Academic Purposes, 9* (4), 280–294.

Lin, G., & Youngsoon, S. (2015). Voices from stakeholders: What makes an academic English test 'international'? *Journal of English for Academic Purposes, 18,* 9–24. **https://doi.org/10.1016/j.jeap.2014.10.002**

Lin, M. C., Cheng, Y. S., Lin, S. H., & Hsieh, P. J. (2015). The role of research-article writing motivation and self-regulatory strategies in explaining research article abstract writing ability. *Perceptual and Motor Skills, 120*(2), 397–415.

Liou, H. C., Yang, P. C., & Chang, J. S. (2012). Language supports for journal abstract writing across disciplines. *Journal of Computer Assisted Learning, 28*(4), 322–335.

Loi, C. K., Lim, J. M. H., & Wharton, S. (2016). Expressing an evaluative stance in English and Malay research article conclusions. International publications versus local publications. *Journal of English for Academic Purposes, 21*, 1–16.

Martin, J. R., & White, P. R. R. (2005). *The language of evaluation: Appraisal in English*. Palgrave Macmillan.

Mautner, G. (2015). Checks and balances: How corpus linguistics can contribute to CDA. In R. Wodak & M. Meyer (Eds.), *Methods of critical discourse analysis* (pp. 154–179). Sage.

Montero-Perez, M., Peters, E., & Desmet, P. (2014). Is less more? Effectiveness and perceived usefulness of keyword and full captioned video for L2 listening comprehension. *ReCALL, 26*(1), 21–43. https://doi.org/10.1017/S0958344013000256.

Nartey, M., & Mwinlaaru, I. N. (2019). Towards a decade of synergizing corpus linguistics and critical discourse analysis: A meta-analysis. *Corpora, 14*(2), 203–235.

Oskoz, A., & Elola, I. (2016). Digital stories: Bringing multimodal texts to the Spanish writing classroom. *ReCALL, 28*(3), 1–17. https://doi.org/10.1017/S0958344016000094.

Samar, R. G., Talebzadeh, H., Kiany, G. R., & Akbari, R. (2014). Moves and steps to sell a paper: A cross-cultural genre analysis of applied linguistics conference abstracts. *Text & Talk, 34*(6), 759–785.

Sinclair, J. (2003). *Reading concordances: An introduction*. Longman.

Swales, J. (1990). Genre analysis: English in academic and research settings. Cambridge University Press.

Swales, J., & Feak, C. (2009). *Abstracts and the writing of abstracts.* University of Michigan Press.

Appendix

List of the articles in the Published Abstract Corpus Cited in this Paper:

Lin, G., & Youngsoon, S. (2015). Voices from stakeholders: What makes an academic English test 'international'? *Journal of English for Academic Purposes, 18,* 9–24. https://doi.org/10.1016/j.jeap.2014.10.002

Crossley, S., & McNamara, D. (2013). Applications of text analysis tools for spoken response grading. *Language Learning & Technology, 17*(2), 171–192. http://llt.msu.edu/issues/june2013/crossleymcnamara.pdf.

Oskoz, A., & Elola, I. (2016). Digital stories: Bringing multimodal texts to the Spanish writing classroom. *ReCALL, 28*(3), 1–17. https://doi.org/10.1017/S0958344016000094.

Montero-Perez, M., Peters, E., & Desmet, P. (2014). Is less more? Effectiveness and perceived usefulness of keyword and full captioned video for L2 listening comprehension. *ReCALL, 26*(1), 21–43. https://doi.org/10.1017/S0958344013000256.

Felton, M., & Crowell, A. (2015). Arguing to agree: Mitigating my-side bias through consensus-seeking dialogue. *Written Communication, 32*(3), 317-331. https://doi.org/10.1177/0741088315590788.

Author's Information:

Ming-Chia Lin is an associate research fellow at the Research Center for Curriculum and Instruction, National Academy for Educational Research in Taiwan. She is interested in studies on EFL learner corpora, EFL technology-enhanced learning, EFL research-article writing, and learning motivation.
Email: lmj@mail.naer.edu.tw

9

Exploring the Motivation Spectrum with Facebook Secret Groups

Christopher Philip Madden, Seikei University

Abstract

Enhancing motivation to study English among low proficiency Japanese university students is a constant concern for many practitioners, therefore a proven motivational method – one that even induces speaking and listening outside of class – would seem to be a potential panacea. Motivation can be recognized as a complex web of influences, such as the interplay between intrinsic and extrinsic factors, the age, faculty and academic level of students, the instructor's methodology and perceived competence, as well as the type, level and content of tasks. This research reports on the differing effects on motivation of students using "Secret" Facebook groups to upload videos and comment (in English) on classmates' videos. With more than 200 medium- to high-proficiency students this method was highly motivational, but with one group of low-proficiency students it garnered three puzzling results.

語学習熟度の低いと考えられる日本人大学生の英語学習に対するモチベーションの向上が多くの教育従事者にとっての関心事あり、動機づける方法の証明は、授業外におけるスピーキングとリスニング学習を誘発する為にも有効な対策であると考える。モチベーションとは、内因性および外因性の因子間の相互作用、学生の年齢、学生の所属する学部や学術のレベル、教授法論とタスクの種類、教師への親近感等の複雑な要因絡みによるものです。自信は、前向きなフィードバックによって増幅させることができます。本稿は、それぞれの学生達が特定のフェイスブックページに数回動画をアップロードし、クラス内で他の学生の動画に対し英語でコメントするという勉強の効果の研究纏めたものである。学習に対する動機づけと英語で話す自信をつけることが、通常の教室だけの学習より上回ることが予測されます。英語の中級から上級の生徒が２００人以上いると、この方法はとてもやる気を起こさせますが、習熟度の低いグループでは３つの理解するのが困難な結果が得られました。

Keywords: **Facebook, Motivation, De-Motivation, Low Proficiency**

Having never seen a Japanese university student without a smartphone this past decade, and also knowing that secret groups on the ubiquitous Facebook platform ensure complete privacy to members, four years ago this researcher decided to utilize these two factors to study the effect that uploading student-made videos has on motivation. Regarding the use of Facebook as a teaching medium, Boon and Beck (2013) noted that it "can provide an effective and convenient means of getting students to use the L2 outside of the classroom period, especially in an EFL setting, whether communicating with the teacher or to one another" (p. 35). While the communicative benefits are likely to be beneficial, and whereas countless research papers report on the positive effects of Facebook groups for various writing activities, it is the video capacity to facilitate the use of all four skills outside of the classroom that arguably holds the most potential benefit, a research area that has not been published to any noticeable degree. The author found that the motivational effect of this method was remarkable, with over 90% of medium- to high-proficiency students reporting positively by questionnaire, (Madden, 2018).

Over the past few decades, numerous research studies into the efficacy of student-created video have been conducted, by and large indicating a positive effect on motivation. One influencing factor seems to be derived from a positive feedback loop involved in planning, then recording, and

eventually sharing one's own videos. It has been reported that when students do so, "many are motivated by this process, particularly if their peers are the target audience" (Kearney & Shuck, 2004, p. 8). Additionally, according to Ockert (2014) the use of video has a direct and strong influence on confidence, which in turn has a powerful effect on the willingness to communicate in a foreign language. Surely all our students could benefit from these, which additionally are likely to increase motivation.

It has furthermore been reported that Facebook, when used with educational intent, can improve the learning process by promoting communication, interaction, collaboration, and resource sharing (Sanchez et al., 2013). One additional communication tool of Facebook is the private message function called Messenger, and students have asked me numerous questions via Messenger about assignment details over the past four years, as well as students letting me know they would be late or absent. Students are similarly encouraged to use Messenger between themselves for pair and group projects. By the same token, Blattner and Fiori in 2009 went as far as to say that, "the popularity of the social networking site Facebook is indisputable… As educators it is essential to take advantage of such technological tools to enhance autonomous language education and abandon our pre-digital instinct and comfort zones."

In a standard university course, conducting in-class speaking assessments is not only very time consuming but often each student gets very little speaking time. Furthermore, even with the use of an explicitly detailed rubric for the students to fill out while their classmates speak, the degree of active listening is almost impossible to assess, whereas the degree of active smart phone use is often easily detected. As aware educators most of us would agree that "in the classroom, relatedness is deeply associated with a student feeling that the teacher genuinely likes, respects, and values him or her," (Niemiec & Ryan, 2009, p. 139). Utilizing Facebook, high levels of feedback can easily be provided, both privately with Messenger, or visibly to the whole group as a regular comment under videos. Moreover, perhaps it can be logically assumed that with relatedness comes enhanced motivation. With these factors in mind, this study was undertaken to hopefully increase motivation through all four skills usage outside of classroom, while also enhancing the experience of classroom community.

At Seikei University in Kichijoji City of Tokyo in April of 2016, two classes were chosen to initiate this research project: a two-semester freshman prerequisite class (n = 26) called Listening and Speaking (hereafter referred to as L&S) with TOEIC scores of over 450; a one-semester elective class of second, third, and fourth year students (n = 29) entitled Cross Cultural Communication Skills (hereafter CCCS). Although no English academic level was provided for this group, I had been informed that their level was similar to L&S. Incidentally, these same two classes were used for data collection in 2017 (CCCS n = 30, L&S n = 24), in 2018 (CCCS n = 29, L&S n = 22,) and in 2019 (CCCS n = 29, L&S n = 25). This current study, however, is for a Global Topics four skills class (n = 21), (hereafter GT), a sophomore group whose TOEIC scores ranged between 185 and 220 on their university-wide mandatory placement tests after their first year of study.

Acknowledging that motivation is enhanced by enriching the experience of classroom community, extra attention was paid by this researcher towards "increasing the amount of communication amongst members, to enhancing the quality of the interaction, and to using various work formations (e.g., pair-work, group work)" (Dornyei & Murphey, 2003, p. 63). Due to the natural interaction Facebook provides, students using this method have more opportunities to learn about each other and share opinions than in a standard classroom setting. Most utilize it. Over the four years of use the bulk of weekly homework video tasks have been viewed by approximately 70% of the students, and Facebook notation showed that countless assignments were "Seen by All" members.

Further benefits of assessment through this study's method include the following: the exact duration of each video is clearly visible, they can be viewed as many times as necessary, and it is easy to assess differences in each individual's speaking level with videos taken many months apart. Furthermore, the number and length of each students' comments clearly reveal the degree of listening by the depth of the contents.

At the end of each first semester students evaluated this Facebook method compared to a regular English class by questionnaire (see Appendix A). The survey was anonymous, in class, and in Japanese. The first question read, "For me, compared to a regular class, this video project class was _____." The options, using a six-point Likert scale, were; a) very motivating, b) quite motivating, c) a little motivating, d) a little de-motivating, e) quite de-motivating, and f) very de-motivating. In other years I also asked about confidence, and each survey had an optional section where students were invited to comment in English or Japanese. While I will compare data for the GT group in the Results and Statistics section, please see Table 1 for the data from L&S and CCCS in 2016 and 2017:

Table 1

L&S and CCCS Motivation Response (n = 106)

	(a)	(b)	(c)	(d)	(e)	(f)
Motivation	26	49	27	1	1	2

Observing that 102 students out of 106 answered on the positive side of the motivational spectrum, I was excited to try it with the GT students in the 2018 academic year. To be fair, I had taught that class for the two previous years and I knew that despite the narrow band of TOEIC scores, some students' abilities were much higher. I assumed correctly that the 2018 GT class would have a similarly large spread of actual English abilities and hoped the Facebook approach would increase motivation.

Research Objectives

The objectives of this research were to examine the extent to which motivation in a low-proficiency sophomore university class could be enhanced by using the proven motivation-enhancing method of filming and uploading numerous videos and commenting on classmates' videos in a Secret Facebook group.

Research Questions

1. Will uploading, watching and commenting on numerous student-made videos increase motivation to study and speak English in a low proficiency class similarly to higher level classes?
2. If there are differences, how can they be explained?

Methods and Procedures

Before each first semester begins, I create a secret group on Facebook for each class, and prepare the research consent and non-disclosure agreements. All explanations related to the Secret Groups, all signing of non-disclosure agreements, and all students being entered into their respective groups are accomplished in a high-paced first class. Many students have never used the app and are assisted by their classmates in its downloading and registration. It is felt that these swift initiating experiences create a bonding effect, which has been reported by Boon (2012) that "signals the start of an educational journey in which students need to cooperate in order to complete tasks successfully" (p. 59). The first week's homework in every class is to make a self-introduction video, and to watch and comment on at least five classmates' videos. It quickly became apparent that students needed to be told that while special effects, background music, and magical video editing techniques are interesting, they in no way garner bonus points.

Assignment Specifics

All classes were informed that assessment would consist of 20% for individual videos, 20% for a paired video, 20% for a group video, 20% for homework (commenting on classmate's videos) and 20% for participation during regular class times. Over the course of each 15-week semester students were assigned approximately 10 solo video tasks with various themes, sometimes related to their textbooks, often not.

The duration of the solo videos was requested to be two minutes, and in most cases the CCCS and L&S students met or exceeded the time. However, from the outset, the bulk of the GT students routinely uploaded videos that did not meet the specified length. In their second class, one GT student complained that he did not want to show his face during the videos (which had not happened previously) and many others nodded in agreement, so I quickly replied that they could show a stuffed animal or anything, because this was a speaking and listening assessment for which showing faces was not necessary. However, from that day forward, approximately 18 of the 21 students pointed their phone at some inanimate object and spoke in a low volume monotone. The contrast between watching GT videos and the other classes was staggering.

While students had been made aware that commenting on others' videos was part of their assessment, after noticing the predominantly brief comments on the first video assignment, I told them that short comments such as, "Nice video," would not count for marks. Most of the CCCS and L&S students immediately began making long and detailed comments, often generating threads of numerous responses, while only a few of the GT students changed the length or depth of the comments. In fact, despite frequent reminders, numerous students made no comments at all.

Acknowledging that when students have higher autonomy they demonstrate higher-quality learning outcomes, enhanced wellness, and a greater value for what the school has to offer (Niemiec & Ryan, 2009), I often gave students the autonomy to choose from options for their weekly video homework. Additionally, at least once each semester students were told, "Talk about anything you want," which not surprisingly produced some of the most amusing and interesting videos. Furthermore, they always selected which classmates' videos to watch and comment on.

As for the paired video role-plays, students chose their own topics and roles, and were requested to speak from four to six minutes per pair. All the CCCS and L&S pairs met the requirements while GT largely did not, complaining of not enough time or opportunity to get together and practice. The fact that they could use Messenger to communicate, send audio, video, and Word documents had been explained numerous times, but it is not known if this method was utilized.

Topics

The field of English education has long recognized that relevant topics are prerequisites for motivation, and accordingly this researcher created worksheets containing interesting themes that were designed to stimulate personal reflection and critical thinking. "Indeed, one of the most de-motivating factors for learners is when they have to learn something that they cannot see the point of because it has no seeming relevance whatsoever to their lives" (Dornyei, 2001, p. 63). If the class textbook seemed uninteresting or disconnected from their lives, I would supplement with my own material. For the CCCS class, some of the solo videos themes consisted of the following; Culture (Japanese and foreign), Personality Traits, Barack Obama's visit to Hiroshima, Freedom of the Press relating to Article 9 of the Japanese Constitution, Trump's visit to Tokyo, stereotypes, climate change, nuclear power, and a comparison of one's own astrology according to Chinese, Western, and Mayan cosmology. Other themes in the other classes were favourite foods, sports, hobbies, family, music, movies, and the like.

By creating a secret Facebook group for your medium- to high-proficiency students, you are quite likely to increase their motivation to speak, read, write and listen to English outside of class. My research with L&S and CCCS students aligns tightly with Green and Crespi's (2012) findings: "The

positive aspects of student created videos are: deeper learning; more engaging learning; more active learning; experiential learning; more personal involvement…" I would say that to some degree all of those learning enhancements happened for most of my CCCS and L&S students but for few of my GT students.

Results

As mentioned, many GT students seemed slightly resistant, and at the start of the third class, noticing that numerous students had not posted the previous week's video, I began the practice of saying, "Thank you for your video," after calling each student's name, or alternatively, "I didn't see your video…" and giving them a chance to explain. This improved the rate of participation to 100% for one week, but then about three, four, or more began to regularly miss assignments. They were reminded verbally in class, and by text messages on our group wall (the other classes did not need reminding), but by half-way through the semester participation was typically about 65%.

By week ten I realized things were so vastly different from the other classes that I might have to cancel the program, and I decided to suggest we should take a vote about continuing Facebook. The response was a clear vote to continue, my first confusing result alluded to in the abstract. The effect was pronounced, as everyone uploaded a video and made at least five comments that week, and yet, one week later, it was back to approximately 70% uploads and 50% comments. We carried on similarly, and the same questionnaire was given to the GT group as to the L&S and CCCS group in the last class. I logically expected the GT results to match the factual evidence of their poor participation and assumed I would cancel the program for the second semester. However, 18 out of 21 students reported this Facebook method to be motivational! The following two graphs display the virtually identical response pattern of the GT students compared to both CCCS and L&S classes for the complete four-year duration of the project (n = 220). These data are shown in order to better contextualize the results and to clearly illustrate the peculiar parallelism.

Figure 1

Four Years of L&S and CCCS Motivation Responses

CCCS and L&S 2016–2019 (n: 220)
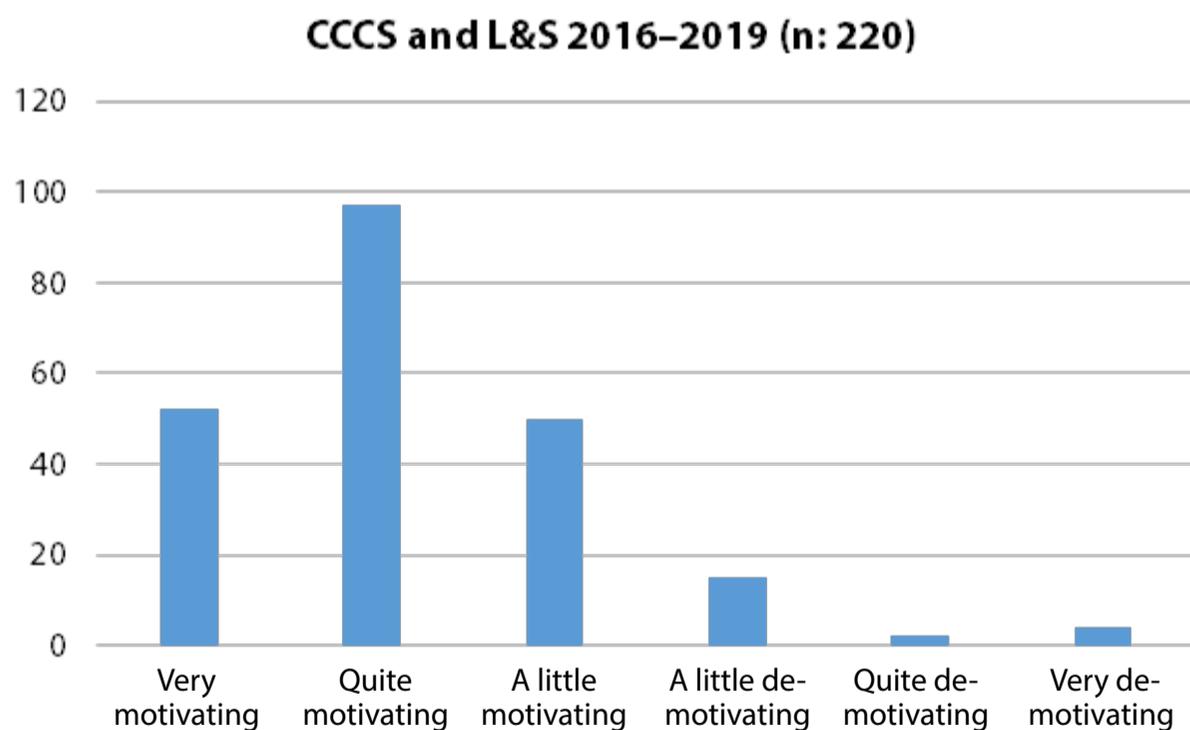
Figure 2
   Global Topics Motivation Responses

GT 2018 (n=21)
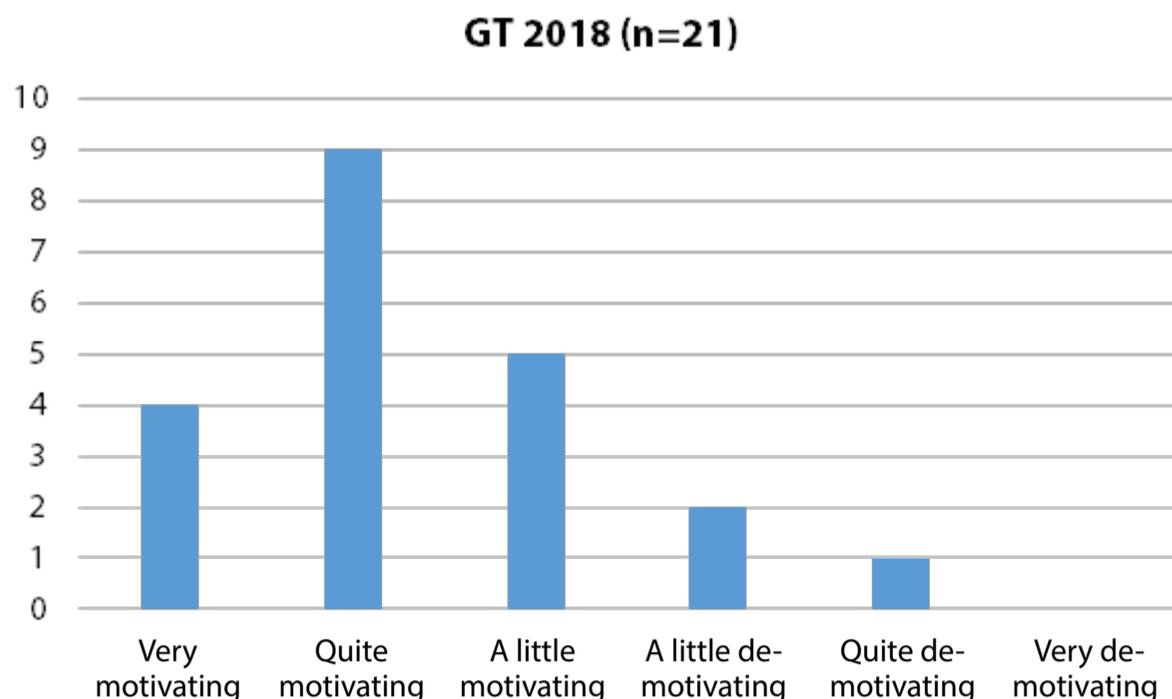
While the tables for these data sets are in the Appendix, the CCCS and L&S chart summary shows 52 students said, "very motivating", 97 students replied with, "quite motivating" and another 50 responded with option (c). This means that 90.45% of the students responded in the positive. Therefore, 21 said that the course was somewhere on the de-motivating side of the equation, with four saying it was "very de-motivating." The GT chart shows almost the exact same curve, while curiously absent of the sixth option's response. One student said the method was quite de-motivating and two reported it to be a little de-motivating. Therefore 18 reported that Facebook was motivating, or 86% of the class.

In order to calculate descriptive statistics, the lettered responses were numbered 1 through 6, with (a) being 1 and (f) being 6. In the case of GT, the mean score was 2.381 and the others' was 2.227. The Standard Deviation of GT was 1.071, compared to CCCS and L&S result of 1.031. After reading these encouraging responses I instantly decided to continue with the program in the second semester, and yet, despite these positive results and my renewed enthusiasm, things rapidly disintegrated.

Quandaries

Keeping in mind the often de-motivational effect that the summer holiday has on resuming studies, I approached things gently in the first class of the Fall semester. We spent half the class talking in pairs and groups about the summer vacation, played a game; then I mentioned that the Facebook assessments would again be 80% of their assessment. Finally, I told them their homework was to post a two-minute video about their summer vacation. Only five were uploaded and sparse comments were made.

In the second class, taking roll, requesting information about why videos had not been uploaded, I received mostly shrugs and mumbled apologies. About 10 students put up their summer videos that day or the next, and the same five students from the first week did the video homework for that week. In the third class I asked again if they would rather go back to textbook and tests and took a vote by show of hands. There was an even split, so I dutifully assigned the third homework video. Only three students did it, and at the beginning of the fourth class I told them I was cancelling the program. Predictably, two or three students were visibly unhappy, most had no expression, and three or four were obviously relieved.

As noted by Taguchi et al. (2009), Japanese students tend to lose interest in English as they progress

in grade level (p. 70), and this certainly seemed to be the case with GT. In the last class of the second semester I gave them a different questionnaire, anonymous, in Japanese, this time requesting information about why they did not like the Facebook project. While six did not answer, the other comments are listed in Appendix B, and to paraphrase, the most common topic of response was, "I didn't do it because other people weren't doing it."

A further amalgamation of five comments from GT, based on lack of knowledge about how to use Facebook or just lack of using it is: "I don't use Facebook much and don't really know how to use it so I forgot to do my homework." However, all students were taught how to use it in the first class, and all students posted many videos, so this was not a valid excuse. The third commonality, and similarly revealing, was about not having enough time, or misjudging how long it would take to make and upload a video, as in this student's quote: "I didn't want to take videos, and I thought it would be fast for me to do them, and I left them for later, but I didn't do them after all."

In any group of students undertaking a project such as this, there will inevitably be some who are not comfortable with the type of perceived scrutiny that being observed can entail. Indeed, with their Facebook research, Boon and Beck (2013) found that with rapport building comes the fear of losing face among one's group members. Subsequently, it was upon reading one student's comments that previously unconsidered concerns came to light: "It is hard to make a video because I must care about the place (silent), my room, clothes and so on." It is likely this sentiment inspired the pointing of phones towards inanimate objects.

Upon resuming traditional textbook teaching with GT, many students' relief was palpable. Comparing them to L&S and CCCS students, who likely feel that some degree of English usage outside the classroom is normal, it can be assumed that most GT students saw no use for English beyond the weekly class time. And herein lies my third shock, the answer to the question, Why did they report the Facebook method as being motivational? After considerable deliberation, my only conclusion could be that they did not lie, and I do not believe they were trying to please the teacher in their responses because it was anonymous. Yes, they liked the Facebook activity more than their regular English classes, but that still did not make them like studying English, or want to speak outside of class, or listen to their classmates' videos, or comment on those videos. Clearly the prevailing intention of most GT students was to not study or make effort outside the classroom.

Conclusion

As a professional educator, it has always been my goal to motivate all my students to best of my abilities, and yet now I agree with Ushida's (2013) findings that

> Students who have low motivation when they begin their university English courses tend to remain rather poorly motivated and succumb to negative learning experiences. On the other hand, students who begin with high motivation are better able to sustain or recover their motivation despite challenges in their learning experiences. (p. 9)

My research fully supports hers, for, despite my intention to raise the motivation of this low proficiency/low motivation group, they overall showed a lack of interest despite contrarily reporting being motivated by the Facebook method. As this was a fairly limited study towards measuring motivation, I can only come to the conclusion that uploading videos that were too short, not commenting on enough classmates' videos, and in many cases not uploading or commenting at all, are clear indications of low motivation. Unfortunately, due to the lack of useful information from the GT responses viewable in Appendix D, I cannot accurately answer my second research question regarding how to explain the differences in motivation without lapsing into pure speculation. However, I would like to clarify that the highest scoring GT students in the second semester tests were not among the few who

uploaded videos in those first three weeks, illustrating the complex set of influences beyond the scope of this research.

Nevertheless, for those students of medium proficiency and above, this Facebook method is clearly extremely effective at increasing motivation. Extrapolating from the data that CCCS and L&S students wanted to improve their English abilities seems logical, and the Facebook project helped them do that. Conversely, we must agree that most GT students likely had no intention to improve, and despite reporting that this method was motivational, they preferred to not do any homework. The fact is clear to me now that, especially in second year university in Japan, very low proficiency indicates very low motivation, which is not likely to change.

References

Blattner, G., & Fiori, M. (2009, January). Facebook in the language classroom: Promises and possibilities. International Journal of Instructional Technologies & Distance Learning, 6(1).

Boon, A. (2012). Here we are now, motivate us. Modern English Teacher, 21(1), 56–61.

Boon, A., & Beck, D. (2013). Facebook Groups. Modern English Teacher, 22(4), 35–41.

Dornyei, Z. (2001). Motivation strategies in the language classroom. Cambridge University Press.

Dornyei Z., & Murphey, T. (2003). Group Dynamics in the Language Classroom. Cambridge University Press.

Green, H., & Crespi, C. (2012). The value of student created videos in the college classroom: An exploratory study in marketing and accounting. International Journal of Arts & Sciences, 5(1), 273–283.

Kearney M., & Shuck, S. (2004). Authentic learning through the use of digital video. https://www.researchgate.net/profile/Matthew_Kearney/publication/228770956_Authentic_learning_through_the_use_of_digital_video/links/00b7d51c3f382ebd71000000.pdf

Madden, C. (2018). Bulletin of Seikei University, 51(4).

Niemiec C., & Ryan, R. (2009). Autonomy, competence and relatedness in the classroom. Theory and Research in Education, 7(2), 133–144.

Ockert, D. (2014). The influence of technology in the classroom. JALT CALL Journal, 10(1), 49–68.

Sanchez, R.A., Cortijo, V., & Javed, U. (2014). Students' perceptions of Facebook for academic purposes. Computers and Education, 70, 138–149.

Taguchi, T., Magid, M., & Papi, M. (2009). The L2 motivational self system among Japanese, Chinese and Iranian learners of English: A comparative study. In Z. Dornyei & E. Ushioda (Eds.), Motivation, Language Identity, and the L2 Self (pp. 66–97). Multilingual Matters.

Ushioda, E. (2013). Foreign language motivation research in Japan: An "insider" perspective from outside Japan. In M.T. Apple, D. Da Silva, & T. Fellner (Eds.), Language Learning Motivation in Japan (pp. 1–14). Multilingual Matters.

Appendix A

Facebook Video Class Survey (English Version)

First of all, let me thank you very much for your participation in this research project. Please fill out this questionnaire with complete honesty, as it has no name attached. Circle the letter that is the best match for your feelings.

1. For me, compared to a regular class, this video project class was _____.
   a) very motivating   b) quite motivating   c) a little motivating
   d) a little de-motivating   e) quite de-motivating   f) very de-motivating

2. Because of this class, my confidence in speaking English has _____.
   a) increased very much   b) increased   c) increased a little
   d) decreased a little   e) decreased   f) decreased very much

3. Please leave any suggestions for video topics that can be used next year:

4. Do you have any advice for next year's students to help them prepare to make this class better?

Facebook Video Class Survey (Japanese Version)

はじめに、この特別なクラスへの参加に対し感謝を申し上げます。このアンケートは無記名ですのでどうか正直に答えてください。それと、私に対する提案事項や、来年度このクラスを受講する生徒にメッセージがあれば記入してください。

1. 一年間このビデオのクラス受講後、普通の英語の授業と比べて_____。
   A) とても興味を起こさせるものだった
   B) なかなか
   C) 少し
   D) やや
   E) あまり興味を起こさせるものではなかった
   F) ぜんぜん

2. 一年間このビデオクラスの受講後、私の英語のスピーキングは_____。
   A)とても自信が持てる
   B) なかなか
   C) 少し
   D) やや
   E) あまり興味を起こさせるものではなかった
   F) ぜんぜん

3. クリスが来年度の授業で使ったらおもしろいと思えるビデオのトピックがあれば記入してください。

4. 来年度の生徒がどうやってこのクラスに対してよりよく取り組むことができるか、何かアドバイスがあれば書いてください。

Global Topics Final Comments

"Other people were not doing it so I didn't want to do it either."

"I don't use Facebook much and don't really know how to use it so I forgot to do my homework."

"I thought I should do it but then class came."

"Why I couldn't do it by the deadline is because I didn't have much concentration in this class. And I thought it would affect my grades so I submitted it even if it was late, but a part of it was because lots of people didn't do it either."

"The people around me were not doing it and we chose between textbooks tests or Facebook."

"I don't use Facebook much, and sometimes I forgot."

"Not used to Facebook."

"I didn't want to take videos, and I thought it would be fast for me to do them, and I left them for later, but I didn't do them after all."

"I liked the Facebook speech. But it's true that I didn't want to post some videos."

"I don't usually open Facebook so I forgot."

"I did my videos every time, so I don't really know why we cancelled the project. But maybe some people were new to Facebook so they didn't know what to do or how to do it."

"I did my homework every time."

"I thought I could submit the video on time but I didn't do it."

"Didn't have time."

"Too much home work!"

"I'm nervous to speak in front of many people, and I don't like recording my voice so this class's works were so difficult for me."

"It is hard to make a video because I must care about the place (silent), my room, clothes, and so on."

Referential Tables

Table 1

L&S and CCCS Motivation Response (n = 106)

	(a)	(b)	(c)	(d)	(e)	(f)
Motivation	26	49	27	1	1	2

Table 2

Four Years of L&S and CCCS Motivation Responses (n = 220)

	(a)	(b)	(c)	(d)	(e)	(f)
Motivation	52	97	50	15	2	4

Note: this is the data for Figure 1.

Table 3

Global Topics Motivation Responses (n = 21)

	(a)	(b)	(c)	(d)	(e)	(f)
Motivation	4	9	5	2	1	0

Note: this is the data for Figure 2.

Author's Information:

Christopher Philip Madden started in 2003 as a JET Programme ALT in Junior High, earned his MA-TESOL and started at Shizuoka Prefectural University in 2009. In 2012 he moved to Toronto, taught at the University of Toronto and a language school. In March 2014 he moved to Tokyo, and teaches at Seikei University.

Email: **chrispmadden@ejs.seikei.ac.jp**

10

Instagram as a Means of Promotion, Communication and Education

Philip Norton, Kyoto Sangyo University

Abstract

In a competitive environment where student course enrolment numbers have an impact on funding, course offerings, teacher hiring, and relevance within the university, promotion and communication are paramount. Instagram is a popular, image-based, subscribe-able social networking service (SNS) format that is a means to reach students and staff through a medium they regularly engage with. This paper is an overview of the process, content, execution, and initial evaluation of Kyoto Sangyo University's Tokubetsu Eigo [Specialized English] program Instagram account. The goal of this project was to create visually attractive, regular posts that students would welcome and be motivated to read. Utilizing cost-free resources including Canva.com design software and Pixabay.com royalty-free images, posts were created in five categories: vocabulary, idioms, test tips, study abroad, and departmental news. Details on the setup and management of the Instagram account including sourcing images and content creation will be discussed. Finally, the results of a pilot study demonstrate a strong degree of effectiveness of this strategy and provide possible directions for further development.

講義を受講する学生数が財源、講義内容、教員の獲得、そして学内における適合性に影響する競争の激しい環境においては、プロモーションとコミュニケーションが最優先事項となる。インスタグラムは人気が高く、画像ベースで、購読の形をとって情報を入手するソーシャルネットワーキングサービス（SNS）フォーマットを持ち、学生や職員が定期的に利用するメディアを介して彼らと連絡を取り合うための手段の1つとなる。本論文は京都産業大学の特別英語課程が開設したインスタグラムアカウントのプロセス、コンテンツ、実施状況、そして初期評価の概要をまとめたものである。本プロジェクトの目標は学生が熱心に見て実際に読みたくなるビジュアル的に魅力的な定期的投稿記事を作成することだ。投稿記事はデザインソフトウェアのCanva.comやロイヤリティーフリー画像のPixabay.comといった費用のかからないリソースを利用して、「語彙」、「慣用句」、「テストのヒント」、「留学」、「学部内ニュース」の5つのカテゴリーで作成されている。画像の調達やコンテンツの制作といった、このインスタグラムアカウントの設定や管理に関する詳細は議論されている。最後に、本予備実験の結果はこの戦略の非常に高い有効性を立証するとともに、今後の開発へ向けて考えられる方向性を示すものである。

Keywords: Instagram, promotion, Pixabay, Canva, student engagement

The image of hunched-over Japanese students staring down at their smartphones on public transportation, while walking in hallways, while resting between classes, and even when sitting in a group, has become ubiquitous. Such representations are regularly interpreted as negative, rather dystopian reflections of the breakdown of real interpersonal communication. On the contrary, they might also be viewed as an opportunity if that heightened degree of focus can be harnessed and used as a means to engage with students in their medium of choice.

The challenges of entering into the realm of SNS are many, with educational institutions often hesitant to embrace newer forms of communication, and the SNS world already oversaturated with content. Communication in this medium needs to be regarded as safe by the host institution, of value to the students, and somehow manage to compete in a flood of information. These initial apprehensions should not deter institutions from entering the SNS world. Solomon (2013) from the UCLA Powell

Library noted when discussing the library's community engagement approach, that SNS applications, especially Instagram, are ideal for engaging undergraduates and have helped the institution reach a wider audience. Fortunately, the dominance of SNS communication means there are numerous tools available to assist in content creation, many of which are free and user-friendly.

This paper will discuss the successful implementation and execution of a cost-neutral English-language-focused Instagram account for the Tokubetsu Eigo (TE) program of the Foreign Languages Faculty at Kyoto Sangyo University (KSU). In an effort to improve the image of the TE program, increase enrollment in the elective classes, and encourage participation in requisite level testing for higher level classes, the TE program team decided to embark on a promotional campaign. The strategy employed was to create visually appealing, image-based Instagram posts of the word-a-day or thought-for-the-day style. These posts would facilitate communication with students regarding key program-related news, act as supplemental English study material, and create a deeper sense of student engagement.

Background

Why Instagram?

In a 2019 profile of SNS trends in Japan, Neely (2019) reported that Japan's top social networks are Twitter with 45 million monthly active users, Instagram with 29 million active monthly users, and Facebook with 28 million active monthly users (Japan's Top Social Networks Are section). Furthermore, it identified Instagram as "the fastest growing social network in Japan" (Neely, Instagram Japan section). Nearly 50% of Japanese university students use Instagram (Senou, 2018, para. 12). with a gender distribution of 56.4% female and 43.6% male (Neely, Instagram Japan section). Additional evidence of Instagram's prevalence can be found in the crowning of the neologisms *insta-bae* or *instagenic* – the taking of pictures that will look good on Instagram – as the Buzzword of the Year in 2017 (Kyodo News, 2017, para. 1).

Other factors in Instagram's favor for use in the TE program's efforts were its simplicity and flexibility. Twitter's text length limitations and Facebook's complexity made them less suitable for the department's goals. Furthermore, Facebook and Twitter promote two-way conversations, something the TE program hoped to avoid due to privacy concerns, logistics, and the time requirements of account maintenance. Instagram allows post creators to selectively turn of commenting on a post while still allowing it to be liked, shared or saved. The final Instagram advantage is that it provides account holders with basic metrics usage regarding audience, reach of posts, likes, and saves. Such data allows insights into the level of engagement and the degree to which a post has been perceived as worthwhile. Further detail on Instagram metrics, known as *Insights*, will be discussed in the Method section.

TE Instagram Strategy

Rather than simply sending occasional announcement posts, TE decided to create daily posts related to English language study, interspersed with departmental news as needed. Regular posting is considered key to an Instagram account's success (Carbone, 2018, Consistency over Frequency section). Solomon (2013) found that for the UCLA Powell Library, "The sweet spot for us is one carefully-crafted photo per day" (Posting section). Furthermore, Solomon cautioned that posting too frequently could lead users to feel overwhelmed, or that their feed was being clogged with unwanted content, thus prompting them to unfollow the offending account (Posting section). One post a day was determined to be an achievable goal for the TE Instagram account.

TE decided to create its daily posts in five categories: Vocabulary Power, Idiom Mastery, Study Abroad, Test Tips, and Tokubetsu News. Posts in all these categories would be part of the same feed

and have a consistent layout. This configuration allowed students to follow the one TE account and get all the different types of posts. Vocabulary posts include the vocabulary word, part of speech, pronunciation, a Japanese equivalent, and usage examples. Idiom posts include the idiom, an explanation, and examples. Test Tips include a short description of the technique in headline form along with further details of the strategy. Study Abroad posts include an interesting country fact as a headline followed by short supplementary exposition. Finally, Tokubetsu News posts consist of the news headline along with other relevant event details such as place and time (examples of the program's Instagram posts are available in Figure 1 below).

Of course, the primary component of each Instagram post is an image. It has been said that on Instagram "images are king" (Meiring, 2015, para. 3), and Solomon (2013) accurately purported that "the better your images are, the more successful you will be" (Posting section). Creating original images was deemed far too impractical and time consuming, so images were sourced from Pixabay **http://pixabay.com**, a cost-free, royalty-free application with professional-quality, downloadable images. The images are available at various resolutions and require no attribution ("Simplified Pixabay License," 2019, What Is Allowed section). Furthermore, the Pixabay image library is searchable via descriptor tags, allowing for efficient image location.

Anatomy of an Instagram Post

At the top of each Instagram post is a thumbnail of the account profile image followed by the account name. Beneath this is the actual post which typically consists of square images or videos with a small bar of reaction options – like, comment, share, and save – beneath the image. Then comes the text, two lines of which are visible in the feed, with the entire passage visible upon clicking the *see more* link at the end of the second line (see Figure 1).

The text portion of Instagram posts has a 2,200 character limit (Jackson, 2017). This section allows for hashtags (#likethis), which are usually keywords such as #vocabulary or catch phrases like #lifeisabeach that can be followed by users who are interested in that topic. Additionally, other Instagram accounts can be mentioned using "@" followed by the username (e.g., @ksu_tokubetsu_eigo). Both the hashtags and usernames appear as hyperlinks in posts and take the user to that topic or user when clicked (see Figure 1).
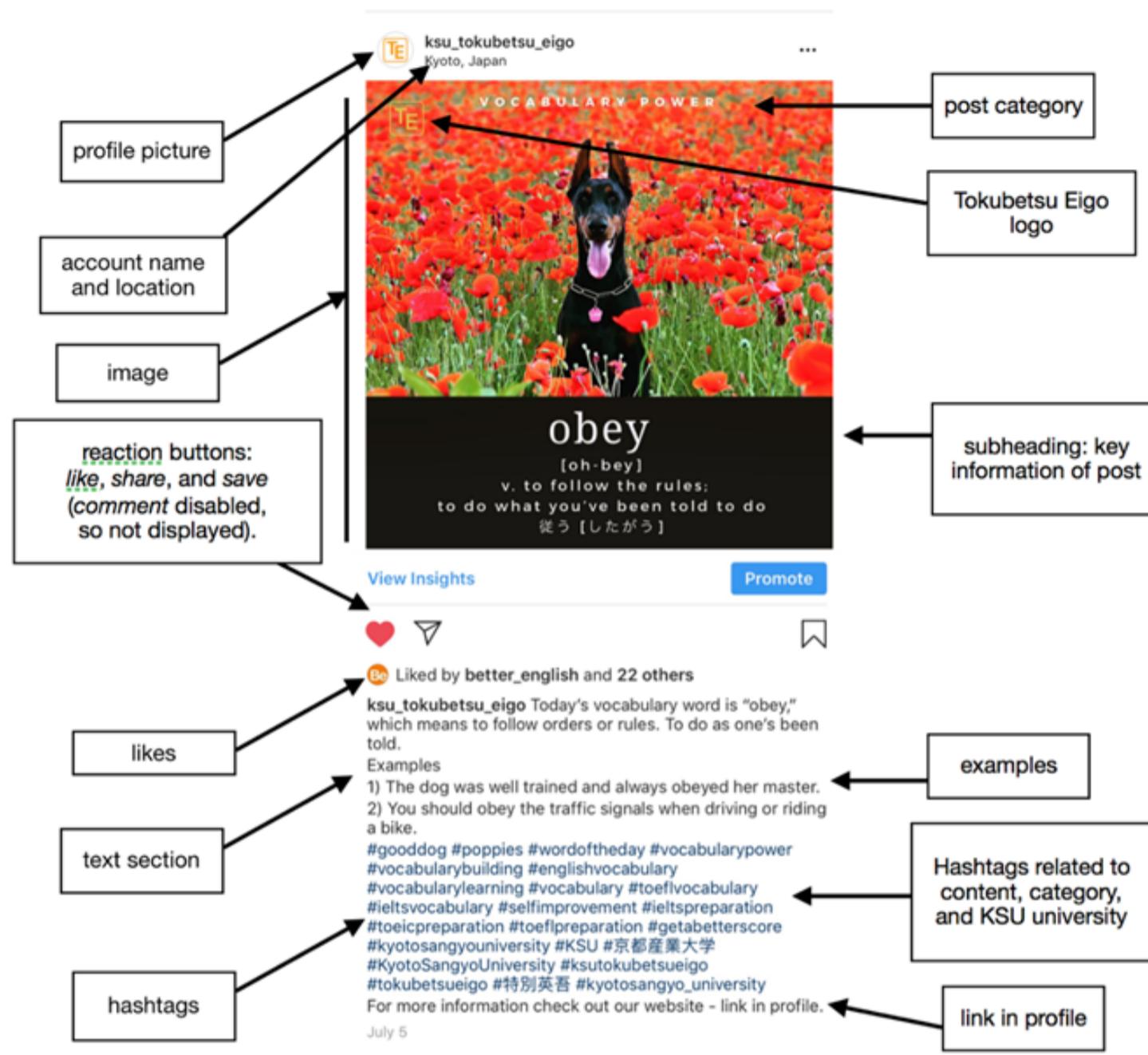
One thing that is not hyperlinked in the Instagram post text section are website addresses. This is one of the downfalls of Instagram when trying to direct users to web content. The standard workaround is to place a line in the text section encouraging users to check the user profile where a website can be included (see the final line of text in Figure 1).

Anatomy of a Tokubetsu Eigo Instagram Post

The image portion of a TE Instagram post contains the following information: the TE logo, a topic heading (vocabulary power, study abroad, etc.), and an attractive image relevant to the topic. The bottom third of the image was used to insert a subheading section and a more detailed text component including the vocabulary word, idiom, study abroad fact, etc. (see Figure 1). This subheading section was vital in that it allowed the program team to use the image to transmit key information as well as be an engaging picture. The layout and aesthetic were kept consistent to allow for better overall brand recognition.

The basic design layout described above was a modified version of a template from Canva **http:// canva.com** – a cost-free, graphic design website and application. In addition to numerous free layouts, templates, fonts, graphics, and images, Canva provides a quick workflow that allows the user

to duplicate designs and then rename and edit those duplicates or replace components as needed. Representative examples of each post category can be seen in Figure 2 below.

Figure 2

Examples of TE Instagram Posts
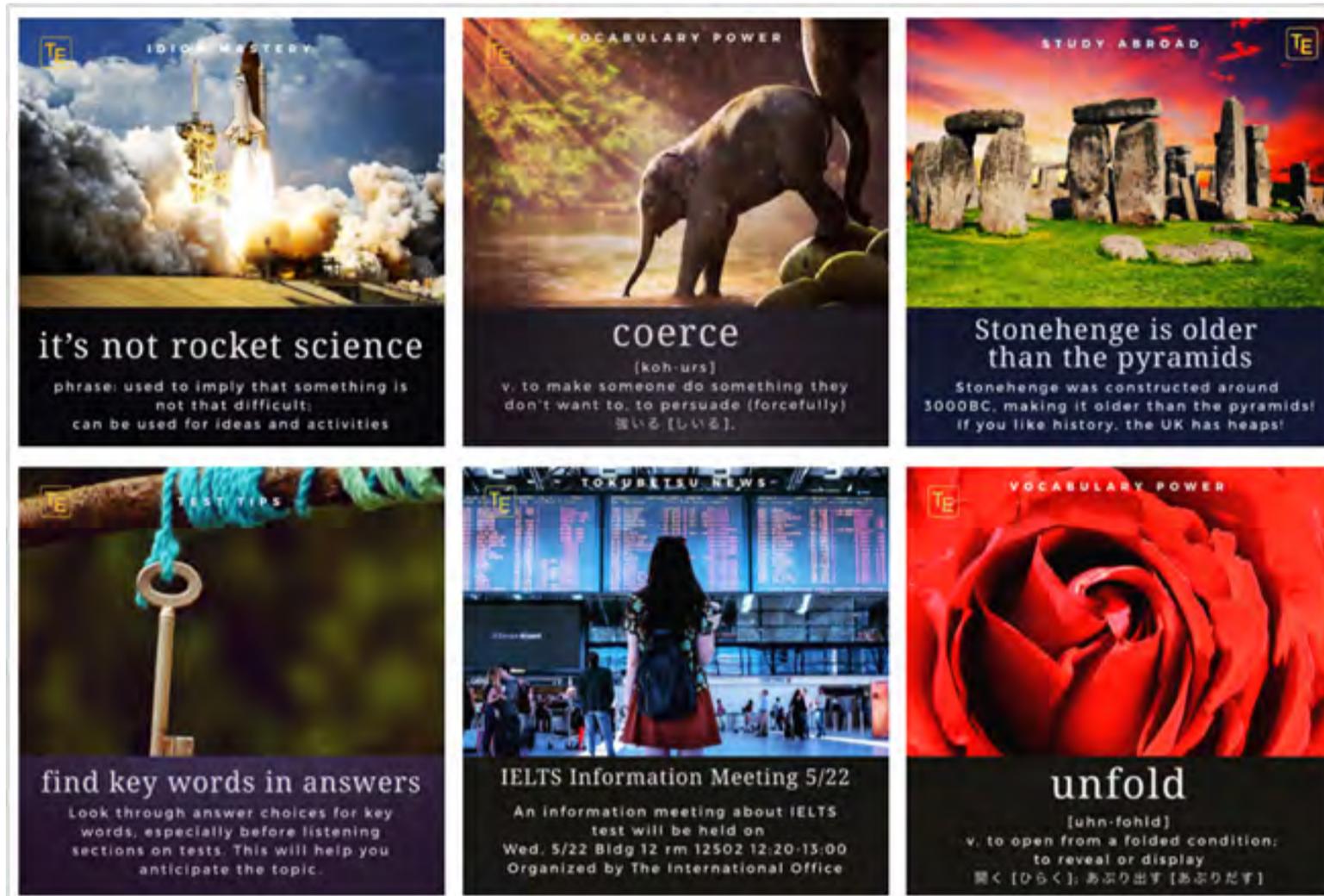
Vocabulary words and idioms were sourced from lists of frequently-occurring TOEFL, TOEIC or IELTS exam content (Sarikas, 2017; "45 Idioms In English," 2018). Study abroad country facts focused on interesting information on the primary study destinations for our university's students: England, Ireland, Australia, USA, Canada, and New Zealand. Test tips consisted of an amalgam of test strategies. Finally, Tokubetsu News was created as needed, focusing on level testing and events.

Method

Two Data Sets

This study gathered data from two sources: the internal Instagram metrics known as Insights, and also a student survey.

Participants

Instagram Insights Participants

The TE Instagram account was promoted to Foreign Language Faculty students at orientation and in classes. The TE Instagram account QR-code-like Nametag was used to facilitate this process. The TE Instagram had 344 followers at the time the Insights data was collated. The number fluctuates slightly as new followers are added, or followers decide to *unfollow* the account.

Student Survey Participants

Three classes of first-year students, one from the Asian languages department (18 students), one from the European Languages department (20 students) and one from the English Language department (21 students), as well as one class of second-year English department students (20 students), were asked to participate in a voluntary survey. Of the 79 students surveyed, 38 first-year students and 6 second-year students responded that they followed TE Instagram and completed the survey. No data on the gender of respondents was collected.

Procedure

Data collection was conducted in weeks seven and fifteen of the spring semester for the student survey and Instagram Insights respectively.

Instagram Insights

Available data from the Instagram Insights metrics was collated for the first semester of TE Instagram posts that were made between April 1 and July 30, 2019. There were a total of 84 posts.

Student Survey

A multiple choice, Japanese-language, paper survey was created to get a broad idea of students' opinions of the TE Instagram account (see Appendix). The Instagram coordinator designed the general questions and then the survey was finalized after consultation with the seven other TE teachers. The questions fell into four categories: student demographics, opinions on the TE Instagram account, recollection of individual posts, and questions about general Instagram usage. Demographic data included only the student's department and year in university. The lack of any identifying information hopefully led to candid responses.

Opinions regarding TE Instagram content were measured by asking students to rate their feelings about various posts on a four-tiered scale of *great*, *good*, *not good*, and *bad*. Opinions were measured related to the TE Instagram account as a whole, as well as to the frequency of posts. Each of the post genre categories were also evaluated. Finally, students were asked whether their impression of the TE Program had changed due to the TE Instagram account, with choices ranging from *improved very much*, *improved*, *didn't change*, *became worse*, and *became much worse*.

Post recollection questions consisted of a list of TE posts (vocabulary: 11 words; study abroad: 5 countries; news: 4 topics), and students were asked to indicate whether they remembered seeing them with a simple yes/no answer. The posts were referred to by the headline of the post and no image was included. The rational for this was to infer whether students retained the information the post was intended to convey, rather than whether they simply remembered seeing the image.

Usage questions inquired about the frequency and times of Instagram checking. Participants were also asked whether they followed any other English Instagram accounts. The survey was administered to the participating students at the beginning of the class. The written instructions asked students who did not have Instagram or did not follow TE Instagram to skip sections not relevant to them. The results of each of the students who followed TE Instagram were collated and the percentages of responses for each answer were calculated by section.

Results

Instagram Insights Results

Audience Demographics

KSU's Instagram account (ksu_tokubetsu_eigo) had 344 followers as of July 30, 2019. The vast majority of followers were from Japan (90%) with almost two-thirds of Japanese followers residing in the cities or Kyoto (57%) and Osaka (5%). Slightly more than half of followers were women. Most of the followers were in the 18–24 age range (78%) (see Figure 3).

Figure 3

Instagram Insights Audience Data for TE Instagram Account
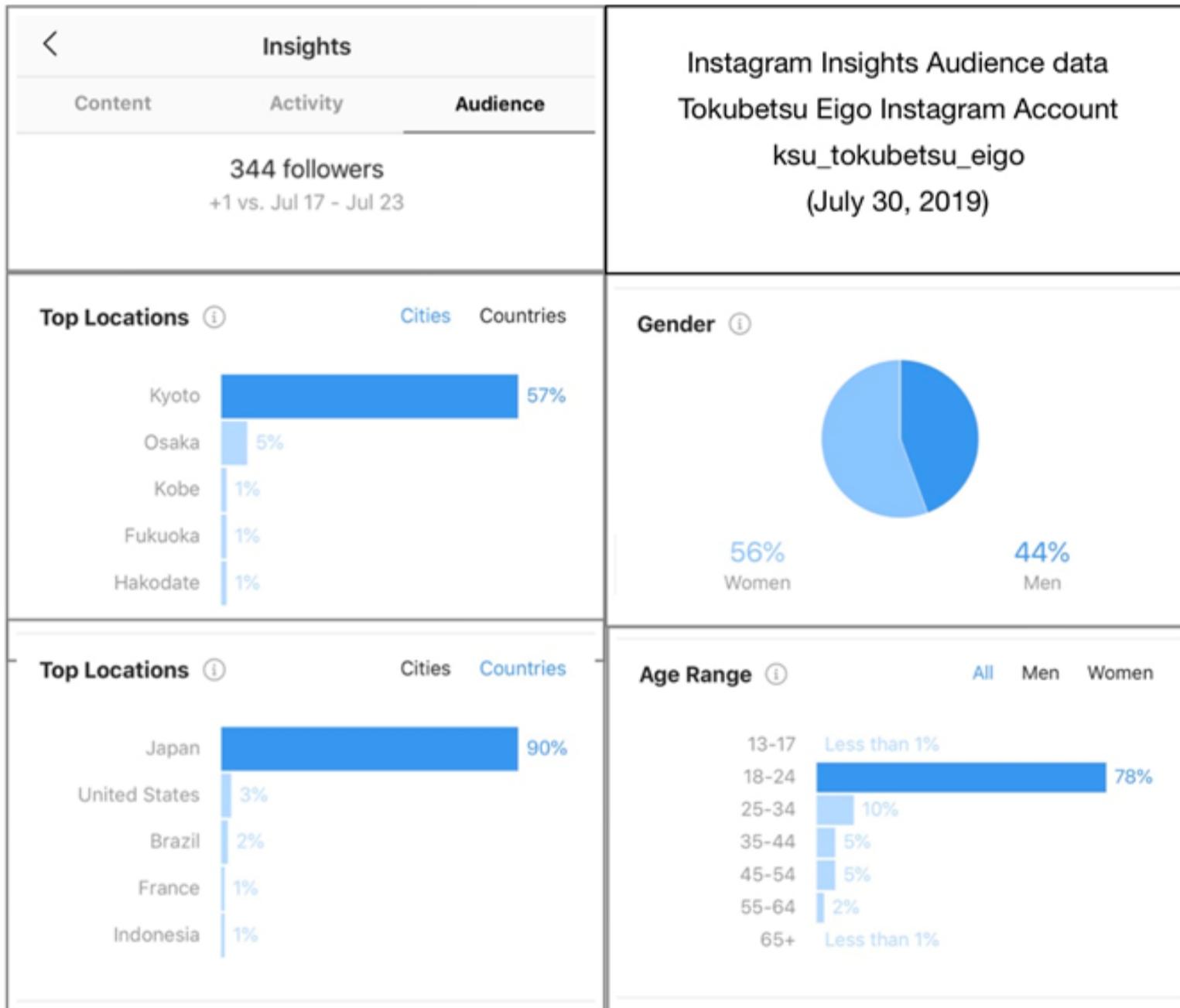
Content and Activity

Instagram differentiates between two types of post views: *Reach* and *Impressions*. *Reach* refers to the number of unique users that have viewed a given post (Hitz, 2019, Reach section). *Impressions* refers to the total number of times a given post has been seen on the screen of all users (Hitz, Impressions section). This means that if a user scrolls up and down through their feed in such a way that a post appears on their screen a number of times, each time it appears on the screen is counted as one Impression.

On Instagram, many users see a post because they follow the hashtags included in the text of the post. For example, a user who wants to improve their vocabulary might follow #englishvocabulary or #wordoftheday. As Reach includes those users who follow hashtags as well as those who follow the actual account, the Reach figure can be higher than the number of account followers (See Figure 4). In the case of the TE Instagram account, where the goal was primarily to reach current students, an *Adjusted Reach* was calculated by subtracting the percentage of those reached who found the post via hashtags (as reported in Instagram Insights) from the total Reach to arrive at an average adjusted reach of 312 followers. The rate of average *Impressions per User* was then calculated by dividing the *Impressions from Home* by the *Adjusted Reach* to arrive at 3.2 Impressions (see Table 1).

Figure 4

Instagram Insights Screenshot Indicating Total Reach and %Reach from Non-followers
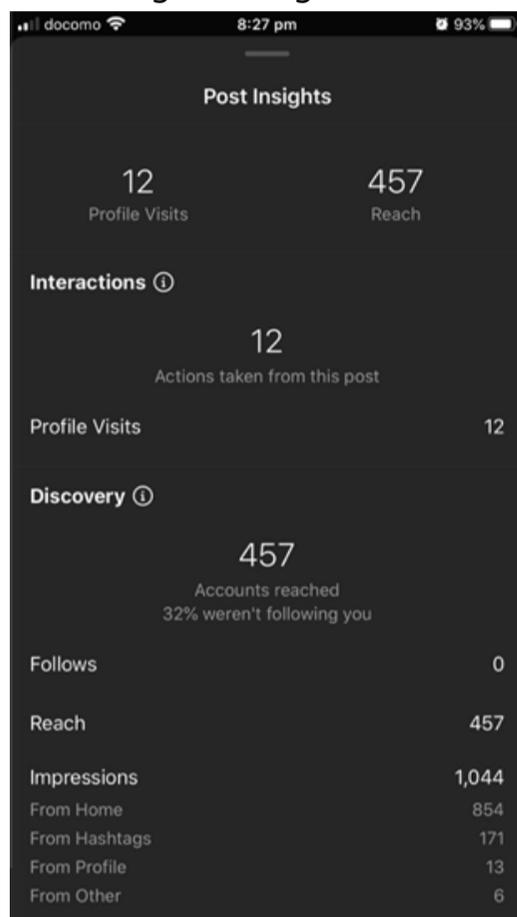
Table 1

Instagram Insights for Tokubetsu Eigo Instagram Posts as Averages

Instagram Insights for Tokubetsu Eigo Instagram Posts (averages – April 1 ~ July 30, 2019)					
Likes	Reach	% Reach from Hashtags	Adjusted Reach	Impressions from Home	Impressions per User
21	421	26	312	1,338	3.2

Legend:

Reach = number of unique users that have viewed a given post

% Reach from Hashtags = percentage of *Reach* that did not come from account followers

Adjusted Reach = *Reach* less *% Reach from Hashtags* = number of followers reached

Impressions = total number of times a post has been viewed by followers (Each time a post is on the screen, this is consider one impression. Thus if a user scrolls up then down and the post passes twice, this is counted as two impressions.

Impressions per User = number of times a user has seen a given post

Student Survey Results

Opinion of TE Instagram Account

All respondents either thought the TE Instagram account was *good* or *great*. Just over 50% of respondents indicated that their opinion of Tokubetsu Eigo had either improved or greatly improved because of the TE Instagram account (See Figure 5). This was an extremely positive result.

Figure 5

Student Survey Data: Opinions on Tokubetsu Eigo Instagram Account

Student Survey Data Impressions - General - Tokubetsu Eigo Instagram Account
ksu_tokubetsu_eigo

What do you think about Tokubetsu Eigo Instagram?

RESPONSE	NUMBER OF STUDENTS
Great	7
Good	37
Not Good	0
Bad	0

Great 16%
Good 84%

Has your impression of Tokubetsu Eigo changed because of Instagram?

RESPONSE	NUMBER OF STUDENTS
Became much better	5
Became a little better	18
No change	21
Became worse	0
Became much worse	0

Became a little better 41%
Became much better 11%
No change 48%

Opinion of TE Instagram Posts

Respondents overwhelmingly thought the TE Post categories were *good* or *great* (90–98%). Test Tips and News posts had the highest disapproval rating with 10% rating them as *not good* (see Figure 6).

Figure 6

Student Survey Data: Opinions of Different Types of Posts

What do you think about TE Vocabulary posts?

RESPONSE	NUMBER OF STUDENTS
Great	19
Good	23
Not Good	1
Bad	0

Great 44%
Good 53%
Not Good 2%

What do you think about TE idiom posts?

RESPONSE	NUMBER OF STUDENTS
Great	18
Good	24
Not Good	1
Bad	0

Good 56%
Great 42%
Not Good 2%

What do you think about TE study abroad posts?

RESPONSE	NUMBER OF STUDENTS
Great	15
Good	24
Not Good	3
Bad	0

Great 36%
Good 57%
Not Good 7%

What do you think about TE test tip posts?

RESPONSE	NUMBER OF STUDENTS
Great	9
Good	29
Not Good	4
Bad	0

Good 69%
Great 21%
Not Good 10%

What do you think about TE news posts?

RESPONSE	NUMBER OF STUDENTS
Great	13
Good	25
Not Good	4
Bad	0

Great 31%
Good 60%
Not Good 10%

Student Survey data
Tokubetsu Eigo Instagram Account
ksu_tokubetsu_eigo

Recollection of TE Instagram Posts

Almost 70% of students recalled one or more vocabulary posts, with Study Abroad posts and News posts both being recalled more than 50% of the time (52% and 62% respectively).

Other English Instagram Accounts Followed

For almost all of the respondents (90%), TE Instagram was the only English language Instagram account they followed.

Discussion

Instagram is anonymous. Therefore, though the inbuilt Instagram Insights are useful in that they give a general overview of how many people are seeing posts, more targeted data such as how many of the followers are KSU students or how many KSU students see the posts, is not available. Be that as it may, the *Reach* and *Impressions* data show that TE Instagram posts were being seen by around 90% of followers with most seeing each post an average of three times. This is an impressive amount of connections and shows that followers are seeing the posts repeatedly.

The recollection figures as shown by the student survey results are 50–70% of the 90% of followers reached. It is impossible from the current study to determine whether students are not spending time to look at the posts or simply are not remembering them. One possible explanation is that, as with any SNS feed, there are some account posts that users regularly read and others they scroll past. One danger of an emphasis on strong images is that, as Verdina (2013) points out, "A world where modes of presentation are more important than what is actually being presented leads to an obsession with 'image' over content or depth" (p. 11). It could be that the good images are diluting the message, but it seems that in order to be noticed in the Instagram environment, using impressive pictures is unavoidable.

The most encouraging results from this study are to be found in the opinions students have about the TE Instagram account and program. All students reported liking the TE Instagram account. Such a positive response is encouraging and seems to indicate that the content is generally being enjoyed, if not always remembered. The fact that students report that the TE Instagram account has improved their impression of the program is the most satisfying result from the program's perspective.

Future Developments

Posts that were more information-dense, such as Test Tips and News, seemed not to be of interest to only a small number of students. News, being one of the primary purposes of the account, will not be changed; however, Test Tips have proven to be more time consuming to prepare and are sometimes difficult to convey in such a compact format, so that genre may be discontinued in the future.

Another potential development that is being considered is to recycle vocabulary and idiom content to increase the educational impact of the account. Some ideas are to have review posts on weekends and re-postings over the semester breaks to increase the chances of students retaining content. This format would also allow the TE account to post fairly regularly during breaks without too much added workload.

Finally, this study did not survey students at events such as the testing days to determine how many were there because they had seen an Instagram post. This is an area the TE program plans to investigate over the coming semesters.

Conclusion

In an effort to increase student engagement and promote the Tokubetsu Eigo program to students at Kyoto Sangyo University, an Instagram account was created. Attractively-designed Instagram posts were produced every weekday during the spring semester of 2019 and included vocabulary, idioms, study abroad, test tips and news items. The in-built Instagram metrics showed that on average 312 of the 344 followers saw each TE post. A student survey found overwhelmingly positive impression of the TE Instagram account with all respondents either rating it *good* or *great*. Furthermore, over 50% of respondents answered that their impression of the Tokubetsu Eigo program had improved because of TE Instagram account.

Instagram seems a valuable SNS tool for increasing student engagement. Having a regular presence on a popular platform with students (Neely, Instagram Japan section) seems to have added a sense of relevance to the Tokubetsu Eigo Program. Most of the account followers are seeing English content on a regular basis, with many of them actually recalling the messages. The results of the student survey are encouraging and the use of Instagram as a means of engaging with students seems to be effective.

References

Carbone, L. (2018, April 1). *How Often Should You Post to Instagram?* https://later.com/blog/how-often-post-to-instagram/

45 Idioms in English You Must Know for TOEFL and IELTS. (2018, May 9). https://www.spokenenglishpractice.com/idioms-in-english-toefl-ielts/

Hitz, L. (2019, July 25). *Instagram impressions, reach, and other metrics you might be confused about.* https://sproutsocial.com/insights/instagram-impressions/

Jackson, D. (2017, May 22). *Know your limit: The ideal length of every social media post.* https://sproutsocial.com/insights/social-media-character-counter/

Kyodo News. (2017, December 1). *"Insta-bae," or "Instagenic," wins 2017 Japan buzzword award.* https://english.kyodonews.net/news/2017/12/1ce8e322ecdb-insta-bae-or-looking-good-on-instagram-wins-2017-buzzword-award.html?phrase=Insta-bae&words=Insta,bae,insta

Meiring, C. (2015, June 19). *Images are the new crowned king.* https://bantersa.com/images-are-the-new-crowned-king/

Neely, C. (2019, January 1). *Japan's top social media networks for 2019.* https://humblebunny.com/japans-top-social-media-networks-for-2019/

Salomon, D. (2013). Moving on from Facebook: Using Instagram to connect with undergraduates and engage in teaching and learning. *College & Research Libraries News, 74*(8), 408–412. https://doi.org/10.5860/crln.74.8.8991

Sarikas, C. (2017, January 6). *Ultimate TOEFL vocabulary list: The 327 best words to know.* https://www.prepscholar.com/toefl/blog/toefl-vocabulary-list/

Senou, A. (2018, March 27). Koukousei tsuitta riyousha no 52. 7% wa "jitsumei riyou", jitsumei riyo shite iru koukousei no uchi 41. 1% wa "subete no hito" ni jouhou o koukai [52.7% of high school students using Twitter use "real names", and 41.1% of high school students using real names share information with "all people"]. https://mmdlabo.jp/investigation/detail_1703.html

Simplified Pixabay License. (2019). https://pixabay.com/service/license/

Verdina, Z. (2013). *A picture Is worth a thousand words: Storytelling with instagram* [Unpublished master's thesis]. University of Antwerp.

Appendix

Tokubetsu Eigo Instagram Survey

(注：インスタグラムのアプリを入れていなければ、回答は不要です)

1) 何年生ですか？　　　1. 1　　　　　2. 2　　　　　3. 3　　　　　4. 4　　　　　5. その他

2) 何学科ですか？　　　1. 英語　　　2. アジア　　　3. ヨーロッパ

3) ksu_tokubetsu_eigo （京都産業大学の特別英語インスタグラム)をフォローしていますか？

　　　　　1. はい　　　2. いいえ

(もし、インスタグラム ksu_tokubetsu_eigo をフォローしていなければ、質問番号12に進んでください)

4) KSU Tokubetsu Eigo Instagramについて、どう思いますか？

　　　　　1. すばらしい　　　2. 良い　　　3. 良くない　　4. 悪い

5) インスタグラムの中の以下の項目について、どう思いますか？

vocabulary（語彙）	1. すばらしい	2. 良	3. 良くない	4. 悪い
idioms （イディオム）	1. すばらしい	2. 良い	3. 良くない	4. 悪い
test tips（テスト対策）	1. すばらしい	2. 良い	3. 良くない	4. 悪い
study abroad（留学）	1. すばらしい	2. 良い	3. 良くない	4. 悪い
news（ニュース）	1. すばらしい	2. 良い	3. 良くない	4. 悪い

6) KSU Tokubetsu Eigo Instagram の頻度についてどう思いますか？

　　　　　1. もっと頻繁にほしい　　　2. 現状で良い　　　3. 多すぎる

7) インスタグラムがあることで、京都産業大学の特別英語に対する印象は変化しましたか？

　　　　　1. とても良くなった　2. 少し良くなった　　3. 変化なし　4. 少し悪くなった　　5. とても悪くなった

8) 以下の国がインスタグラムに載っていたことを覚えていますか？

Australia(オーストラリア)	1. はい	2. いいえ
US(アメリカ)	1. はい	2. いいえ
UK(英国)	1. はい	2. いいえ
Ireland（アイルランド）	1. はい	2. いいえ
Canada（カナダ）	1. はい	2. いいえ

9) 以下のニュースがインスタグラムに載っていたことを覚えていますか？

MReader オリエンテーション	1. はい	2. いいえ
レベルテスト	1. はい	2. いいえ

スピーキングクラス　　　　　1. はい　　　2. いいえ

IELTS　　　　　　　　　　　　1. はい　　　2. いいえ

10) MReader オリエンテーション、レベルテスト、又は IELTS のミーティングに行きましたか?

　　　1. はい　　　2. いいえ

11) 以下の単語がインスタグラムに載っていたことを覚えていますか?

　　　solitary　　　　　1. はい　　　2. いいえ

　　　knack　　　　　　1. はい　　　2. いいえ

　　　intricate　　　　 1. はい　　　2. いいえ

　　　transfer　　　　　1. はい　　　2. いいえ

　　　plunge　　　　　　1. はい　　　2. いいえ

　　　opponent　　　　　1. はい　　　2. いいえ

　　　consideration　　 1. はい　　　2. いいえ

　　　identical　　　　　1. はい　　　2. いいえ

　　　obstacle　　　　　1. はい　　　2. いいえ

　　　verify　　　　　　1. はい　　　2. いいえ

　　　extinguish　　　　1. はい　　　2. いいえ

12) 一日にどのぐらいの頻度でインスタグラムをチェックしますか?

　　　1. 滅多にしない　　　2. 1–3 回　　　3. 4–6 回　　　4. 7–9 回　　　5. 10 回以上

13) 何時頃にインスタグラムをチェックすることが多いですか? (当てはまるものがあれば、複数回答可)

　　　1. 午前6–9時　　　2. 午前9–12時　　　3.午前12時-午後3時　　　4. 午後3–6時
　　　5. 午後6–9時　　　6. 午後9–12時

14) 土曜日、日曜日の場合、インスタグラムのチェックの頻度が増えますか、それとも減りますか?

　　　1. とても増える　　　2. 少し増える　　　3. 変化なし　　　　　　4. わからない

　　　5. 少し減る　　　　6.とても減る

15) KSU Tokubetsu Eigo Instagram 以外に、英語のインスタグラムアカウントをフォローしていますか?

　　　1. はい、たくさん　　　2. はい、少し　　　3. いいえ

Author's Information:

Philip Norton has over 15-years EFL teaching experience at Japanese universities. He has published two poetry collections, co-edited *Short Fuse: A Global Anthology of New Fusion Poetry* (Rattapalax, 2002), and released numerous spoken-word and music tracks. He received two Australian national poetry awards and is working on a new collection.
Email: **infuse.norton@gmail.com**

11

Listen up! Useful Materials for Intensive and Extensive Listening

Louise Ohashi, Meiji University

Abstract

Language learners can gain much from engaging in both intensive and extensive listening practice. The Internet offers a myriad of tools to choose from to target listening skills; so many, in fact, that it can be difficult for learners and teachers to know which ones to adopt. This article, which is based on a workshop delivered at JALTCALL2019, introduces a range of listening materials that have been favourably evaluated by the author and her students. The main aim of the article is to familiarise language teachers with CALL/MALL tools they could incorporate into their lessons and recommend to their students for out-of-class study. It offers readers examples of useful listening materials in the following categories: stories (The Fable Cottage and Storyline Online); songs (Lyrics Training); talks and conversations (TED Talks, TEDICT and ELLLO); and, news and current affairs (ABC News English and Voice of America). Furthermore, the article proposes ways in which teachers can support out-of-class listening. While it cannot serve as a complete supplement to the hands-on experience of the workshop it's based on and does not offer an exhaustive list of effective audio tools, it provides readers with a solid starting point from which they can further explore independently.

語学の学習者は、extensive listening（多聴）とintensive listening（精聴）の練習の両方を行うことで多くを得ることができる。インターネットには、リスニングスキルを向上させるための様々なツールが数多く存在している。選択可能な学習教材があり過ぎて、学習者や教師がどれを採用するべきかを決めることが難しい。小論は、JALTCALL2019で行われたワークショップを基に、著者とその学生が優れていると評価した様々なリスニング教材を紹介するものである。小論の主な目的は、語学教師が授業に取り入れることができ、教室外学習用にも推奨しうるCALL／MALL教材を知ってもらうことである。読者に以下のカテゴリーの有益なリスニング材料の例を提供する――物語（The Fable Cottage、Storyline Online）、歌（Lyrics Training）、スピーチと会話（TED Talks、TEDICT、ELLLO）、ニュースと時事問題（ABCニュース英語、Voice of America）。さらに、教師が教室外のリスニングをサポートする方法を提案する。小論は、JALTCALL2019で行われたワークショップに参加した実体験に代わるものではなく、また効果的なオーディオツールの網羅的なリストを提供するわけでもないが、読者自身が独自に探求するための出発点となりうるであろう。

Keywords: **CALL, MALL, listening development, out-of-class learning**

Recent developments in technology and increased global mobility mean that aural-oral communication between people from different language backgrounds is becoming increasingly common and necessary. Understanding what is said by others in a foreign language is a long and arduous path but for many language learners it is an integral aim. The obstacles that hinder listening development may be frustrating, but overcoming them can be very rewarding and "learners may feel a great sense of achievement once they manage to become proficient L2 listeners" (Chen, 2019). In recent years the Internet has opened up innumerable opportunities for learners of varying proficiency levels to study languages and dialects from around the world, providing tools that make L2 listening mastery a more attainable goal. However, the mere existence of CALL/MALL (computer/mobile assisted language learning) tools has not transformed the world into a population of people who can readily understand

each other. Many language learners still struggle to comprehend oral speech because tools are simply tools and serve no purpose without effective use. To fully understand speech in a foreign language, learners need sustained practice at a range of difficulty levels over an extended period of time. The Internet can offer this, but the breadth of resources available online can make it overwhelming for both learners and educators to locate appropriate ones. Furthermore, without support from a learning community, such as from teachers and classmates, learners may find it difficult to sustain their usage of appropriate materials long-term. This article, which is based on a workshop with the same title (hereafter "Listen Up") that was held at JALTCALL2019, aims to help educators to address these two issues.

To fully develop their listening skills, language learners should do both intensive listening and extensive listening tasks. During intensive listening tasks, learners focus on understanding specific parts of texts and listen for specific information such as particular words and phrases or details. This type of listening is generally done with short oral texts and has pre-set tasks that listeners aim to achieve through the tasks. Schmidt (2016) identifies tasks such as gap fills, transcription, prosody marking and pronunciation activities as commonly-used, effective examples of this type of listening. Intensive listening may also focus on areas such as vocabulary and grammar, or learners may need to find answers to comprehension questions. Materials may be challenging for learners and they may need to listen multiple times.

On the other hand, during extensive listening, learners are exposed to a large amount of content that they can comfortably understand without the need to stop and listen again. The focus is not on understanding each and every part or analysing the text for discrete learning points. Rather, the aim is to gain a global understanding and to listen for enjoyment, picking up linguistic features over time. In this type of listening, the focus is on meaning over form (Reinders & Cho, 2010). Researchers in this area have stressed that the majority of the materials learners access for extensive listening should be comprehensible to them (Waring, 2008), with Reinders and Cho (2010) selecting extensive listening materials for learners that were "somewhat challenging but easy enough to encourage learners to persist in and enjoy listening to it" (para. 9). While some learners will be able to choose appropriate listening materials by themselves, others may need assistance from educators in the form of content curation, in which teachers select a range of materials for learners to work with (Chen, 2019).

In addition to the level of materials, there are other factors to consider in guiding successful engagement in extensive listening. Vandergrift and Goh, who have conducted multiple studies on developing listening skills in language learning (for example, see Goh, 2002; Goh & Taib, 2006; Vandergrift, 2004, 2005), identify *variety*, *frequency* and *repetition* as central principles of extensive listening (Vandergrift & Goh, 2012). They suggest that variety can be achieved by listening "to as many different types of authentic listening texts as possible, on a wide variety of themes and topics. Types of texts include narratives, recounts, information, reports, instructional or procedural texts, expository or argumentative texts, and conversations" (Vandergrift & Goh, 2012, pp. 200–201). This allows learners to gain familiarity with the structure of different text types and exposure to vocabulary use in diverse contexts. In terms of frequency, individual learner's circumstances will dictate what is possible or needed, but as a general rule, learners should engage in listening tasks in "manageable and realistic chunks of time" (Vandergrift & Goh, 2012, p. 201) that could range from daily to weekly practice. Finally, repetition is valuable as it allows learners to gain familiarity with the content, structure and vocabulary within spoken texts. Furthermore, repeated listening reduces the cognitive load by "freeing [learners'] attention and limited working memory resources to focus on other points or features of the text. With repetition, listening processes become automatic in the long run, a key to effective listening" (Vandergrift & Goh, 2012, p. 201). Due to the sheer amount of time needed for extensive listening, most of it is done outside of class. Therefore, educators need to consider ways they can convey the importance of variety, frequency and repetition to their learners and, ideally, help facilitate integration of these factors into students' learning programs.

The Internet offers a wide range of materials that can be used for extensive listening, but Vandergrift

and Goh (2012) offer words of caution to educators, noting that not all learners can adequately take advantage of use these opportunities "because they lack the skills to direct their own extensive listening activities. Many still remain dependent on their language teachers to assign listening homework for further practice" (p. 129). For educators who want to foster students' self-directed listening, they suggest facilitating a system which prompts students to focus on planning, monitoring and evaluation, which are central metacognitive processes for self-directed learning (Vandergrift & Goh, 2012). Alm's (2013) study with 28 German learners drew on Vandergrift and Goh's (2012) recommendations and offers a possible model for consideration by language educators. In her semester-long study, students self-selected podcasts by drawing on recommendations made during their course and shared their experiences of using them with their teacher and classmates through weekly blog posts. At the end of the semester, learners completed a podcast review in which they described and evaluated a podcast and explained the strategies they had used to develop their listening comprehension. The combination of the in-class introduction to podcasts, the weekly blogging and the final podcast evaluation task practically addressed Vandergrift and Goh's (2012) recommendations to assist learners with planning, monitoring and evaluation. Alm's (2013) study found that the "blogging activity provided language learners with the guidance and structure needed for varied and regular listening practice" (p. 266) and noted that participants valued being able to select materials to listen to and could align them with their personal listening goals. In Alm's study, the blogs served the function of learning logs, which "can be powerful tools to share learners' needs and their learning process with teachers and empower learners to lead their learning" (Lee & Cha, 2017, p. 271). Lee and Cha (2017) introduced learning logs, or more specifically listening logs, to a group of 42 English language learners in Korea and found that a semester of engagement with them had a positive effect upon learners' listening comprehension and motivation. The listening logs included a summary of the listening materials they accessed, a personal response to the content, a reflection on their English abilities and a review of the listening strategies they used. Feedback from these students indicated that the listening logs were helpful tools for raising confidence in their listening ability and managing their learning.

The experiences of researchers like Alm (2013) and Lee and Cha (2017) are encouraging and their studies offer practical options to educators who wish to support their own learners' use of listening tools outside of class. Their work focuses on extensive listening tasks but it should be noted that the support tools they used, such as listening logs, could also be effectively utilised to support intensive listening tasks. With some methods for supporting extensive and intensive listening now established, the sections below introduce useful audio tools that were presented in the JALTCALL2019 "Listen Up" workshop.

Audio Tools for In-Class and Out-of-Class Use

This section introduces listening materials that fall into four categories: 1) stories; 2) songs; 3) talks and conversations; and, 4) news and current affairs. In each section, specific tools are introduced with an overview of their main features and some of the benefits they offer to learners.

Stories

Stories not only offer language learners the opportunity to encounter their target language in a cohesive, description-rich format, they also have the potential to capture listeners' imagination and motivate them due to the interest and enjoyment they can elicit. This section introduces two storytelling tools that can be used free of charge.

The first one, The Fable Cottage **https://www.thefablecottage.com/**, is designed for learners of English, Italian, French, Spanish and German. The site uses voice actors to narrate well-known stories such as *Cinderella* and lesser-known tales such as *The Bird and the Whale*. In the English version of

each story, listeners can opt to have the transcript visible or hidden. For all other languages, listeners can choose to see the transcript in the target language and hide/reveal English translations in small segments as the audio progresses. Each story is five to sixteen minutes in length. Anecdotally, I can recommend this site not only as a language teacher but also as a learner, having used it in French and Italian, and can attest to its usefulness for a wide range of learning goals such as understanding gist and detail, acquiring new vocabulary, identifying grammar patterns for replication and improving pronunciation through shadowing.

The second tool is Storyline Online **https://www.storylineonline.net/**. On this site, learners can watch videos of people reading children's books aloud in English, with the option of adding subtitles. Some of the narrators are very well known, such as Elijah Wood from the *Harry Potter* movie series, and this may further motivate some learners to engage with these materials. Each video lasts between five and sixteen minutes, with the time displayed below a copy of the cover page of each book. This site was designed to develop literacy skills in children but this does not mean it is unsuitable for English language learners. On the contrary, it offers a good opportunity for exposure to a wide range of vocabulary and grammatical structures that are presented with pictures and read at a moderate speed in a range of accents. While the contents may appeal more to younger learners, the linguistic benefits that can be gained through this site and the interesting videos that accompany each story make it a valuable resource for learners of all ages.

Songs

The Internet offers countless opportunities to access songs in languages that are used throughout the world via sites that allow users to listen with or without seeing the lyrics. Among them, Lyrics Training **https://lyricstraining.com/** stands out as a tool that can be used for both intensive listening and extensive listening. This useful study aid can be accessed through the URL above or downloaded onto a smart phone through the App Store or Google Play. It has a library of songs in English, French, Italian, Japanese, Spanish, Portuguese, German, Dutch, Turkish, Polish, Swedish, Finish and Catalan. Users can listen to songs and sing along (karaoke mode) or challenge themselves further by completing lyrics gap fill tasks (game mode). The number of gaps can be modified to alter the level of difficulty, with 10% of lyrics missing at beginner level, 25% at intermediate level, 50% at advanced level and all lyrics missing at expert level. The level of difficulty can also be adjusted by selecting different game modes as users can play in write mode (answers must be typed) or choice mode (answers are selected from four options).

Registration is not required, but it is free and allows users to compete with others in rankings for songs at each difficulty level and records all games they play so they have a complete record of their usage. These two functions are available on the website and app versions. The website offers additional functionality for registered users, such as allowing them to save their favourite songs to a section called My Lyrics and allowing them to create tailor-made gap fill activities with the songs. This can be particularly useful for teachers who wish to create activities with certain words missing to draw attention to features such as vocabulary, grammar or pronunciation. Teachers can create a PDF of the lyrics, with or without gaps, to share with learners for in-class and out-of-class study. Music, perhaps more than most audio materials, lends itself to repetitive listening tasks as listeners tend to enjoy hearing songs again and again. The pleasure that music brings can encourage even reluctant learners to do listening tasks for self-study, so this tool is highly recommended for learners who lack motivation to do listening practice outside of class.

Although the greatest advantage of Lyrics Training is the linguistic benefits it can offer, such as vocabulary acquisition, improved pronunciation, familiarization with grammar patterns and improvement in spelling, it can also help learners in other ways. One benefit that some readers may find noteworthy is that is can help students improve their typing skills. In Japan, where JALTCALL2019

was held, it is common for new university entrants to have low-level typing skills. However, it is also common for them to need to take English proficiency tests that require them to type responses on a computer, such as the TOEFL iBT. Poor typing skills can have a detrimental effect on students' writing scores in such tests, so it is imperative to build these skills, but practicing typing can be a monotonous, burdensome task. With Lyrics Training, students practice typing as a by-product of playing games, providing an additional reason to use this tool. At the time of print, users can play three songs within each 30-minute period for free, with unlimited usage available for ¥550 per month or ¥3,800 for an annual subscription.

Talks and Dialogues

Listening to speakers talk about a range of topics in semi-scripted and unscripted speech can be highly beneficial to language learners as it exposes them to natural usage patterns that they are likely to encounter in real life situations. This section focuses on tools that provide opportunities to listen to speeches (TED/TEDICT) and short, unscripted monologues and dialogues (ELLLO).

The first two tools in this section are TED Talks, which is an extensive collection of speeches, and TEDICT, which is an app that draws on TED Talks to provide users with a range of language learning tasks. The TED Talks website **http://www.ted.com/talks** and app were created by TED (Technology, Education and Design), a non-profit organisation that aims to share "ideas worth spreading." It does this by hosting live events and sharing recordings through its digital resources, with over 3,100 talks from speakers around the world currently accessible. The audio content is in English but subtitles and transcripts are available in over 100 languages. Viewers can search by topic, subtitle/transcript language and length to find talks that suit their needs. In terms of functionality, while watching videos, subtitles can be switched on or off and viewers can refer to an interactive transcript. Clicking on any part of the transcript takes viewers to the corresponding section within the video, which can be useful when learners want to listen to the pronunciation of particular words or phrases or check how they are translated. Finally, viewers can alter the speed of the videos, reducing it when necessary to help with comprehension. Access to this site is free of charge.

While the TED Talks site alone offers abundant opportunities for extensive and intensive listening, the TEDICT app brings additional value. For example, users can listen to segments of TED Talks for dictation tasks. There are two ways this is possible. One option is to select the TEDICT function and type what they hear or use speech recognition to complete the task. For an easier alternative, they can choose the TEDICTisy function, which allows them to select the words required to complete dictation tasks from a list. This app also allows users to do shadowing activities using the Repeat Player function. This function breaks videos into short sections that learners listen to then try to replicate when the voice recorder is activated. They can listen to themselves before moving to the next segment to check their pronunciation. These functions are available on a trial basis with the lite (free) version of the app, appearing only on some videos or for some segments of videos, with access to more content available for purchase for a range of fees.

The final tool that will be introduced in this section is ELLLO **http://www.elllo.org**/, which stands for English Language Listening Library Online. It is a collection of audio and video files that give listeners access to clips made by speakers from around the globe who speak English at various degrees of proficiency. The site offers over 1500 audio files and more than 800 videos. Each audio file comes with a script, vocabulary support and a comprehension quiz. They involve one or two speakers and are short, with some under a minute in length and others not lasting no more than several minutes. If learners want to hear about a particular topic from multiple perspectives they can use the Mixer section, which brings together six audio files from speakers who answer the same question. The site also offers One Minute English video files, in which a speaker, or occasionally two speakers, answers a pre-set question in approximately a minute. Users can listen with the transcript hidden or visible and

can opt to take a short comprehension quiz. On this site, it is possible to select audio and video files by English level, topic area, and nationality of speakers. The latter option makes this tool particularly useful for learners who would like to hear the way that English is used by people from countries all around the globe rather than just the limited varieties that tend to be accessible through formal English education, particularly here in Japan.

News and Current Affairs

There is a wide array of news and current affairs sites available online and each can provide distinct benefits to learners. This section introduces one that is particularly useful for Japanese L1 speakers and another that offers benefits to learners interested in issues that affect students and youths.

The first tool, ABCニュース英語 (hereafter translated as ABC News English) **https://www6.nhk.or.jp/kokusaihoudou/abcns** is a website produced by Japan's national broadcaster, NHK. The materials are aimed at Japanese speakers who are learning English, with the interface in Japanese and all English listening tasks offering Japanese support. A new video clip is uploaded to the site four to six times a week. Each five-minute clip follows the same pattern. First, there is an overview of a current news item in Japanese and a key word or phrase is introduced. Next, a short, authentic news clip is played three times, first with English audio and subtitles, then with English audio and Japanese subtitles and finally with English audio and no subtitles. Key expressions are re-examined with Japanese explanations and model sentences in English then the news clip is played a fourth time with English audio and subtitles. Users can also download support materials in the form of written translations of key sections of the audio clip. The Japanese language support provided and the multiple opportunities offered for short, focused listening make this website a particularly suitable tool for Japanese speakers to use for intensive listening practice.

Voice of America **https://www.voanews.com/student-union** is another option for listening to news and current affairs. Like most news sites, it offers content on local and international news so is useful from that perspective. However, it was introduced in the JALTCALL2019 "Listen Up" workshop for its VOAStudentU section, which the site creators describe as "news for students and youth worldwide." While the majority of content in this section is written text, some articles are accompanied by related videos, offering learners the opportunity approach topics from these dual focal points. Audio and accompanying written content in this section is not only useful for developing comprehension skills, it also helps learners to forge a connection with issues that are relevant to students and can provide opportunities for developing understanding of key issues related to student life in different cultural contexts. The content is not designed specifically for English language learners and there are no subtitles available so it is challenging, but it could be used for intensive listening practice by students with lower proficiency, perhaps with in-class teacher guidance, and intensive or extensive listening practice by those at high levels. For level specific content, the Learning English **https://learningenglish.voanews.com** section of the site is valuable. Materials are separated into sections for beginner, intermediate and advanced level learners, and include not only news items, but also resources that are designed to help students learn news-related vocabulary and develop news literacy skills.

Discussion

The materials introduced in the "Listen Up" workshop at JALTCALL2019 and here in this article provide educators with a range of options that they can consider for integration into their particular teaching contexts. All of the materials can be used for in-class or out-of-class activities, both as teacher-led and student-led tasks. Personally, I have found it most beneficial to combine in-class and out-of-class usage. For example, when introducing Lyrics Training, I generally choose a popular song that is not too fast and demonstrate how to use karaoke mode and game mode by connecting

my computer to a projector. Part way through the game mode demonstration, I invite some students to take over the game on my computer and encourage their classmates to help them complete the missing words by shouting out answers. If time permits, students play one game individually or in small groups on their phones or laptops, and if there is not enough time available to practice after the demonstration, they are asked to try playing it for homework. In class, we discuss the affordances Lyrics Training offers, such as the potential to acquire new vocabulary, improve pronunciation, notice grammar patterns, learn correct spelling and improve typing speed. This method of demonstrating how tools work and providing opportunities to use them with teacher support is important, particularly when the interface of tools is not in the learners' L1. Ensuring students understand how a tool works and know valid reasons for spending time using it outside of class is vital as not all learners will figure out how to effectively operate new tools without guidance and may not recognise the full potential of new tools unless benefits are made explicit. Once my students begin using this tool, I ask them to keep a record of what they listen to, which is done automatically if they register, and they periodically share their learning experiences during class time, both to help them focus on the benefits they may be gaining and to encourage them to continue studying.

For in-class learning, teachers have many options with the tools introduced in this article. For instance, ABC News English could be used for note-taking, summarising and translation tasks. To give another example, ELLLO's One Minute English section, in which speakers respond to a pre-set question, could be used for shadowing and listening comprehension tasks. After listening, students could engage in related speaking tasks, such as responding to the same question prompt or discussing their views on the speaker's response. For out-of-class study, the most open-ended option is to simply introduce new listening tools in class, demonstrate how they work, allow students to try them if facilities and time permit, then recommend they use the tools outside of class or set them as homework. However, as demonstrated earlier in this article by the work of Vandergrift and Goh (2012), Alm (2013), and Lee and Cha (2017), there is much benefit to offering additional support that helps learners to plan, monitor and evaluate their listening study, so it is recommended that educators find effective methods to incorporate such steps in ways that are suitable for their teaching contexts.

Conclusion

This article has sought to provide support to language teachers who wish to facilitate development of their students' L2 skills by using online audio materials. It outlined the key differences between intensive and extensive listening and offered methods and materials that educators can use to help learners develop their listening skills in and out of class. Teaching and learning contexts vary widely so the tools and learning support methods offered in this article need to be considered in relation to those needs, but it is hoped that the guidance offered will be of value to readers, prompting them to consider adoption or adaption in ways that suit their contexts.

References

Alm, A. (2013). Extensive listening 2.0 with foreign language podcasts. *Innovation in Language Learning and Teaching, 7*(3), 266–280. https://doi.org/10.1080/17501229.2013.836207

Chen, C. W. (2019). Guided listening with listening journals and curated materials: A metacognitive approach. *Innovation in Language Learning and Teaching, 13*(2), 133–146. https://doi.org/10.1080/17501229.2017.1381104

Goh, C. (2002). Exploring listening comprehension tactics and their interaction patterns. *System, 30*(2), 185–206. https://doi.org/10.1016/S0346-251X(02)00004-0

Goh, C., & Taib, Y. (2006). Metacognitive instruction in listening for young learners. *ELT Journal, 60*(3), 222–232. **https://doi.org/10.1093/elt/ccl002**

Lee, Y. J., & Cha, K. W. (2017). Listening logs for extensive listening in a self-regulated environment. *Asia-Pacific Edu Res, 26*(5), 271–279. **https://doi.org/10.1007/s40299-017-0347-0**

Reinders, H., & Cho, M. Y. (2010). Extensive listening practice and input enhancement using mobile phones: Encouraging out-of-class learning with mobile phones. *TESL-EJ, 14*(2). **http://www.tesl-ej.org/wordpress/issues/volume14/ej54/ej54m2/**

Schmidt, A. (2016). Listening journals for extensive and intensive listening practice. *English Teaching Forum, 54*(2), 2–11. **https://americanenglish.state.gov/files/ae/resource_files/etf_54_2_pg02-11.pdf**

Vandergrift, L. (2004). Listening to learn or learning to listen? *Annual Review of Applied Linguistics, 24*(3), 3–25. **https://doi.org/10.1017/S0267190504000017**

Vandergrift, L. (2005). Relationships among motivation orientations, metacognitive awareness and proficiency in L2 listening. *Applied Linguistics, 26*(1), 70–89. **https://doi.org/10.1093/applin/amh039**

Vandergrift, L., & Goh, C. M. (2012). *Teaching and learning second language listening*. Routledge.

Waring, R. (2008). Starting an extensive listening program. *Extensive Reading in Japan: The Journal of the JALT Extensive Reading Special Interest Group, 1*(1), 7–9. **http://www.robwaring.org/el/articles/Starting_Extensive_Listening_ERJ_June_2008.pdf**

Author's Information:

Louise Ohashi began teaching English in 1999 and has taught in Australia, Japan, England, Italy and Spain. She holds a Master of Education (TESOL) and a PhD (Education). Her research interests include CALL/MALL, learner autonomy and the role of teachers in fostering self-directed learning.

Email: **ohashi@meiji.ac.jp** Twitter: @ohashilou

12

A Microblog Corpus Using Tumblr for Understanding Japanese University Students' EFL Writing

Robert Anthony Olexa, International Pacific University
Sara Librenjak, International Pacific University

Abstract

This pilot study presents an analysis of the EFL writing produced by Japanese university students (n = 474) in core English classes. Students were asked to write one post a week on the microblogging platform Tumblr over 15 weeks. The blog posts were manually copied, pasted, and compiled into a microblog corpus. The writing was then analyzed using Compleat Lexical Tutor. A separate word list, including target words from the textbooks used in class, was also used. Analytical tools were used to gain a better understanding of how students were learning and using the words when writing. The findings show an initial 63.67% coverage of target words. However, the coverage dissipates when analyzed for repeated word use. In turn, the analysis of words that were not covered reveals several interesting findings. Examples of frequently used words and phrases are presented with the further intent of developing a research-based approach to improving pedagogy for writing skill in the Japanese English as a Foreign Language (JEFL) context.

この予備実験では、日本人の大学生（n = 474）が必修英語授業で作成したEFL文章の分析を書いた。学生はマイクロブログと言うのTumblrに週1回で投稿するように依頼された。ブログ記事は手動でコピーが取れ、マイクロブログコーパスにまとめられた。それから文章はCompleat Lexical Tutorを使って分析を行った。授業で使用されている教科書の中から対象となる単語を含む別の単語リストも使用した。分析手段は、学生がどのように学んでいるか、そして書くときに言葉を使っているかのより良い理解を得るために使われた。調査結果は文法狙いとターゲット語彙の最初の63.67％の適用範囲を示している。ただし、単語の繰り返し使用について分析すると範囲は失われる。それに加えて、カバーされていない語彙の分析は、いくつかの興味深い発見が得られた。頻繁に使用される語彙やフレーズの例は、英語は外国語として（ＪＥＦＬ）の文脈での文章力を向上させるための研究ベースのアプローチを開発するという目的を持って提示される。

Keywords: **Learner Corpus, EFL writing, microblogging, Tumblr**

Getting students to write a lot is one way that has been shown to increase students' English as a foreign language (EFL) writing skill (Tuan, 2010). However, the writing assignments often pose challenges for both students and teachers. For instance, it is becoming increasingly difficult to distinguish text written by humans and machine-produced text. Japanese university students, especially non-English majors, who take a functional approach to English, begin to see little value in time spent writing in a foreign language without the use of translation software. The student perception of the effectiveness of translation using assistance represents a challenge to any EFL writing teacher. Suggestions have been made to "raise student awareness of the inefficiency of machine translation" (Apple & Kikuchi, 2007). However, despite measures taken to restrict the use of translation software, students persist in doing so. Therefore, systematic analysis of learner corpora can provide anoverview

of EFL writing assignments, especially what students are writing about and how students use the words they learn in their English courses.

Rationale for Using Microblogs

The microblogging platform used in this study is Tumblr **https://www.tumblr.com**, sometimes referred to as a "lightweight blog" platform (Chen et al., 2011). As the name suggests, microblogs describe a condensed version of the long-form blog, which is often used for regular public journaling on the Internet. The technical features of a traditional blog are aimed at extensive formal writing. In contrast, the conventions of microblogs (Instagram, Twitter, and Tumblr) offer lesser degrees of formality that include and encourage multimodal expression through the addition of embedded pictures, video, or sound.

Compared with other microblogs, Tumblr allows more written content. At the time of writing, Twitter **https://www.twitter.com** allows for a maximum of 280-character posts, Instagram **https://www.instagram.com** allows for 2,200 characters, and Tumblr allows for 500,000, including HTML and spaces. However, a 2014 statistical overview of Tumblr done by Chang et al. (2014) shows that 78.11% of Tumblr consists of photo posts while 14.13% consists of written posts. Despite having the option to write more, the average post size on Tumblr is also much smaller at 426.7 bytes or approximately 100 words. Worldwide, Tumblr is the second-largest microblogging platform after Twitter (Chang et al., 2014). The majority of users come from the United States (33%), followed by the United Kingdom (5.89%), Brazil (4.39%), Canada (4.29%), and Germany (3.71%) (Clement, 2018). Where Tumblr is not as popular as Twitter or Instagram in Japan, students who were familiar with the more popular platforms were able to understand the format and put it to use easily.

Microblogs have been reported to encourage play and promote student motivation towards language learning (Perifanou, 2009). As of December 2016, almost half of Tumblr users in the United States were aged 34 years and younger, with 18 to 24-year olds accounting for 25.7 percent of US Tumblr audiences. Consequently, interest in microblogging for educational purposes is increasing (Dowling, 2013). However, it is unclear to what extent this is being explored in Japan, where only a reported 44% of universities offer classes with an online component (MEXT, 2015).

Japanese University students in remedial English classes have often been described as "low-skilled" and "low motivated" (Fellner & Apple, 2006). Similar constraints have been reported in surveys into the beliefs of language learning of teachers and students in the JEFL classroom (Kimura et al., 2001). The conventions of Tumblr are familiar, accessible, and current. Also, the majority of Tumblr users are teens and young adults. Therefore, microblogs may be a suitable tool for encouraging writing in the JEFL context.

Learner Corpora for Improving Pedagogy

Compilation of specialized learner corpora for typifying and understanding learner language use has been ongoing since the 1990s (Granger, 2002). There are at least six major learner corpora compiling the written and spoken production of Japanese learners (Université catholique de Louvain, 2019). Also, there are many other specialized corpora used in individual studies examining the written output of Japanese learners (Foss, 2009).

A learner corpus can provide valuable information towards what English students are learning in the course, how students are using English, and also provide clues that allow us to make inferences into the types of tools students are using to complete assignments. The research questions are as follows: 1) How much coverage of target language from the textbooks (lexical and grammatical) is covered in written student output? 2) What are the types and tokens of null and off words that students

use? Finally, 3) What can be inferred from the observation of student writing produced by beginners that appears to be unnatural or unintelligible to skilled users of English.

Methodology

Error Analysis (EA) using corpora can give direction to pedagogy regarding the intelligibility and naturalness of learner English. Where corpora studies can provide detailed information on the frequency of grammatical and lexical errors, some researchers have called attention the necessity of classifying errors in a way that shows communicative competence (Izumi et al., 2005).

When assessing student errors, we may assume to some extent that learners will use dictionaries and other sources to learn new words in the second language. In doing so, they may make unnatural lexical or structural choices. However, the research questions of this study aim to address a situation in which students may not view assignments as a means to the acquisition of English. While this study is not sufficient enough to determine with exactness where students have used translation software and where they have used other methods, it does present an overview of the current realities of how EFL writing assignments are addressed in the Japanese university context. By methodically observing the frequency of student language use, we hope to provide direction for pedagogy that moves students to view themselves as English learners and by extension to approach asssignments with the goal of language acquistion.

The Course and Student Profile

The participants (n = 474) were freshman and sophomore students enrolled in mandatory English courses at a 4-year university in Japan. At the time of the study, there were a total of 2,740 students in the school. Students enrolled in the courses were from the Business (n = 510), Child Development (n = 269), Education Management (n = 589), Health Science (n = 229), International Studies (n = 119), and Physical Education (n = 1,030) departments. As indicated by the disproportioned number of PE students, the university has a reputation for its sports programs, and many students in other departments spend a fair amount of time engaged in extracurricular sports activities such as soccer and track and field.

All students at the university are required to take three semesters of mandatory English courses. There are a number of elective English courses available at the university, including content-based and test-prep courses. However, the majority of students opt not to take these courses viewing English as more of a credit requirement than a necessary skill for future employment. Classes meet once a week for 90 minutes, and a semester lasts 15 weeks. The syllabus follows the progression of the *English Firsthand* series (Helgesen et al., 1999). Over 15 weeks, students will complete all 12 units in each book. The textbooks are rated by level according to the Common European Framework of Reference (CEFR) for languages. *Firsthand Success* is rated at a low A1 level, *Firsthand Access* at a high A1/mid A2 level, and the *Firsthand Level 1* textbook at a mid A2/low B1 level. These courses are designed to help students develop communicative competence, and students are mainly engaged in speaking activities during class time. However, following the format of the textbook, students were required to complete short written quizzes at the end of the chapter aimed at confirming their comprehension of vocabulary and target grammar. The quizzes are a maximum of 15 questions, and the problems varied in each unit from information gap, collocation and sorting problem, multiple-choice, and crossword puzzles.

Japanese Tumblr English Learner Corpus (JTELC)

The Japanese Tumblr English Learner Corpus (from now on, JTELC) was compiled over two years (4 semesters). Students (n = 474) were asked to download the Tumblr application to their phones or

to use the web application on their PC. After students created their Tumblr pages, a list of names from each classroom was compiled, and then each account was followed by the teacher's account. Students were required to create one post weekly. The criteria for posts was that they have a minimum of 3 sentences, be original (not copied), and that the students did not use translation software to complete their posts. Students were given a rubric for grading and writing was scored accordingly: 50% for accurate English use (grammar, vocabulary), 30% for content (logical, interesting, thoughtful), 10% for visual aspects (flow, pictures, movies) and another 10% for English used from the textbook.

The student posts were manually copied and pasted into a word document and then compiled into a corpus, and then analyzed using the Compleat Lexical Tutor, revealing a total of 74,845 tokens and 6,442 types. The average tokens used per blog was 157.9.

Using Tumblr as the source for the corpus provided some constraints. For instance, users familiar with conventions of microblogs often used hashtags (#) as a way to draw attention to their posts, words like #Japan would be identified by Lextutor as a separate word type than "Japan." Students often used Emojis, which did not convert well to text form and were excluded from the study. Some students would embed text in pictures using third-party apps on their phones before making a post. These text in pictures were excluded from the corpus. Also, a minimal amount of text characters or symbols from the operating systems of certain phone brands did not display and were excluded from the corpus.

Figure 1

Example Student Tumblr Post Screenshots by Author
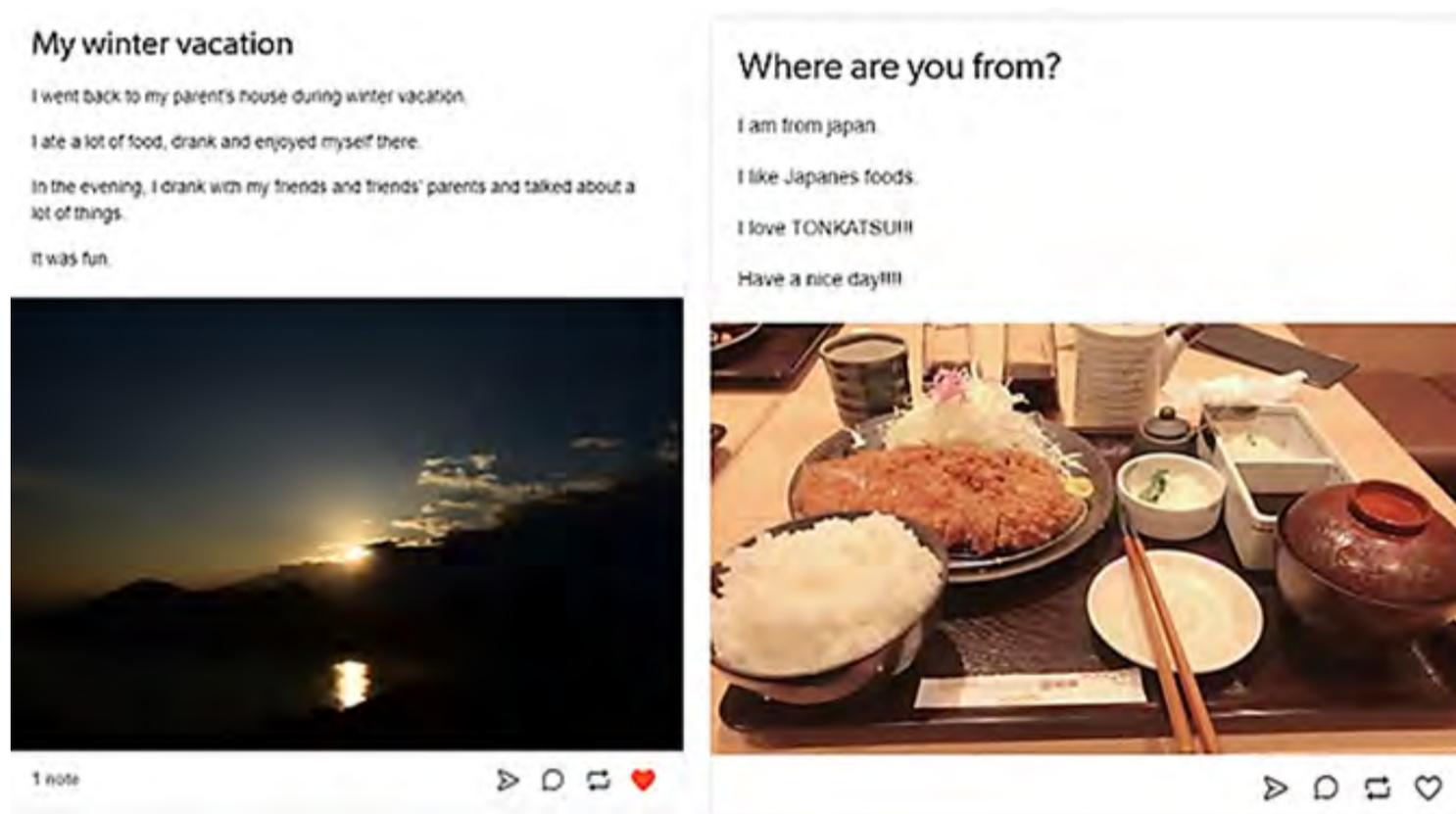
Firsthand Word List (FWL)

A list of target words from the textbooks used in class (*English Firsthand* series) was also used. The teacher resources for the *Firsthand* textbooks provide a vocabulary "word map" for each textbook, which is a comprehensive word list covering all of the target words and phrases from the textbooks. Because the formatting of the word map was not sufficient for research purposes, the text was copied into a different document and edited to avoid redundancy. The text was compiled into a *Firsthand* Word List (from now on, FWL) that includes 6,381 tokens and 1,908 types.

According to the *Firsthand* curriculum, the FWL represents material from a low CEFR A1 level to

mid B2. There is no way to gauge accurately which of these words students have come into contact with or acquired before taking each course. Also, the words from the word maps were extensively taught in the course. However, they were not taught in their entirety.

The Test in Practical English Proficiency, 実用英語技能検定 (*Jitsuyō Eigo Ginō Kentei*) is commonly referred to as EIKEN, a conflation of the words *eigo* (English) and *kentei* (test). A 2015 report by the Ministry of Education Culture, Sports, Science, and Technology (MEXT) showed that only 11% of students in upper secondary schools across Japan had achieved a minimum grade 2 or higher level. According to the 日本英語検定協会 (*Nihon'eigokenteikyōkai*) or the Japanese Association of English Testing (2019), the equivalent of EIKEN grade 2 is a CEFR B1 level. While pre-grade 2 has been determined as CEFR A2. While the report shows 53% of students were ascertained to have achieved a pre-grade 2 level or higher, 32% of students achieved at least pre grade-2, and 20.8% were only estimated to be around the same level, meaning that the level could also be lower (MEXT, 2015). The statistical data from the MEXT report reveals the relative levels of first-year university students attending the university for this study suggesting that around half or more of the students eligible to enter unviersities have English level equivalents of around or below a CEFR A2 level.

Considering the language teaching maxim of "*i+1*" or that second language acquisition happens when learners are presented comprehensible input that is at, or just above, their level (Krashen, 1992) the content of the course is assumed to be appropriate for the student levels. Following the assumption that they are low-level students, we can also assume that the majority of students will not know the words on the FWL or that they will be slightly above the student's level. Therefore, the FWL should serve as a relevant resource in determining the coverage of words used by Japanese University Students taught with the Firsthand curriculum.

Analysis and Findings

The posts were initially compiled and edited using Microsoft Word. They were then further cleaned using Notepad++ with regular expressions. The JTELC was analyzed with the help of the Lextutor website **https://www.lextutor.ca** (the Frequency Tool, Text Range Tool, Sentence Extractor, Text-lex compare, N-Gram, and Vocab profiler). Further analysis was then performed on the data retrieved from Lextutor.

Text-Lex Compare

In regards to the first research question, the Lex-Compare feature on Lextutor was used to determine the coverage of student output in comparison to the target words from the FWL. The Text-Lex Compare feature allows for the subtraction of one text from another, shows the degree of word repetition over a set of text, and also reveals the word coverage of words between two texts. The initial analysis shows 50,981 tokens, and 1,905 types shared between texts, a total of 63.67% coverage of the target words in the JTELC. However, when we further analyzed coverage for repetition, we found that word usage dissipated significantly. The 63.67% tokens do appear in both JTELC and FWL. However, this measure does not take the token frequency into account. In other words, if a word appears only once in any of Tumblr posts, it will be counted as covered. While this is technically correct, the coverage of words that appear only once cannot be considered relevant. Out of 6,360 types, those with frequency 1 (appearing only once) constitute more than half of all types (3,463 out of 6,360, or 54%).

In order to counter this, we normalized the measure in the following way: (1) Extract the token frequency in JTELC, (2) Calculate list difference in FWL and JTELC using different token frequency as thresholds, eliminating words that appear less than, e.g. 2, 4 or 10 times. Table 1 shows different coverage rates for different thresholds. The words which appear four or more times in all blogs constitute only about one-quarter of all types in the corpus. However, knowing this 25% of words enables a

reader to understand 90% of all tokens in the corpus. Similarly, words with frequency ten or more represent less than 10% of all types, but due to their frequency, they represent about 85% of tokens. This is in accordance with Zipf's law, which states that the frequency of any word is inversely proportional to its rank in the frequency table.

Table 1

Percentage of Word Types Covered at Different Thresholds

Minimal frequency threshold	Percentage of types in JTELC covered	Percentage of text JTELC covered	Number of shared types (FWL types = 1905)
1	100% (6360/6360)	100%	1206
2	45.6% (2897/6360)	92.69%	1016
4	24.6% (1568/6360)	90.04%	808
10	9.4% (600/6360)	84.57%	531
20	7.3% (465/6360)	78.66%	361

Figure 2

This Chart Shows the Minimal Type Frequency in the JTELC Compared with the FWL
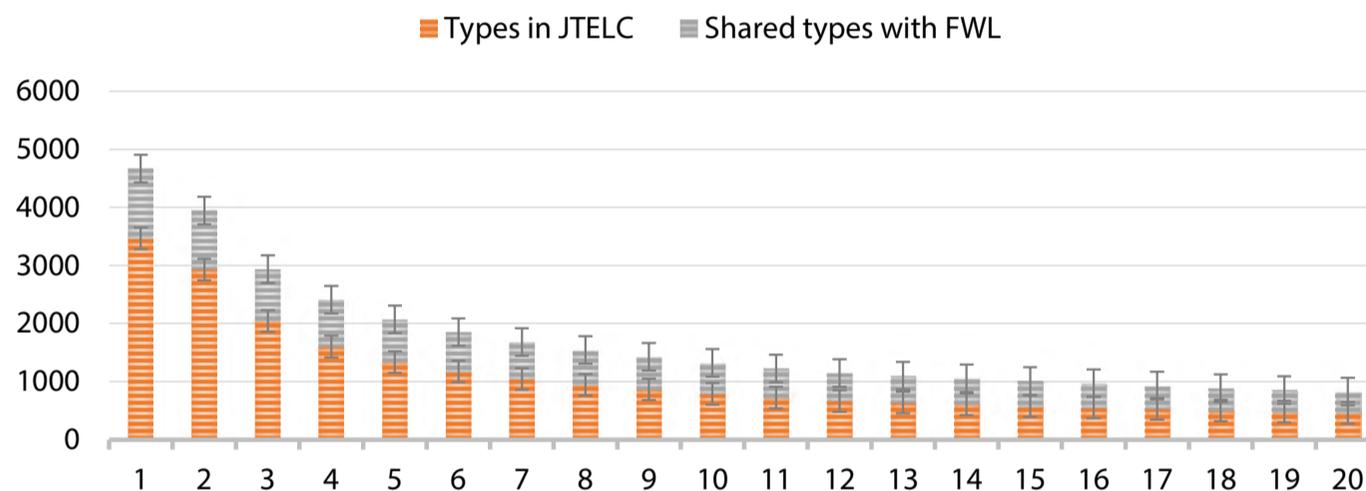
As we can see from Table 1 and Figure 2, the number of shared types between JTELC and FWL is almost the same if we disregard the words with the lower frequency. On the other hand, if we disregard the words with the frequency lower than 11, we will be looking at less than 10% of all types and less than 85% of token coverage in the JTELC. Considering that there were 474 students, and an average student wrote 157.9 words throughout the semester (15 weeks), as well as taking the above figures into the account, we can approximate the minimal relevant frequency threshold to be between 2 and 10 appearances. We will also be removing frequency 1 words since a large majority are names, errors, and non-words.

Using these thresholds, we can calculate the precision and recall of target words (i.e. words in FWL) from our corpus. Precision (P) is defined as:

$$P = \frac{\text{shared types}}{\text{total FWL types}}$$

and represents how much of the text used in JTELC was relevant to the material taught. Using minimal frequency threshold of 2 and 10, we found the precision to be:

$$P2 = 1016 / 1905 = 0.533 \qquad\qquad P10 = 808 / 1905 = 0.424$$

Next, in order to verify to what extent do the shared types represent all relevant words, we will calculate the recall. Recall (R) is defined as:

$$R = \frac{\text{shared types}}{\text{total JLTELC types of a given frequency}}$$

Using the same thresholds as above, we calculate the recall:

$$R2 = 1016 / 2879 = 0.352 \qquad\qquad R10 = 531 / 600 = 0.885$$

Recall is as low as 35.2% when including low-frequency words. Around 65% of types are not from the material taught. However, it rises dramatically when we exclude the words with frequencies lower than 10, signifying that 88.5% of words used frequently in the students' texts are relevant to the taught material. However, this seemingly positive number has a couple of drawbacks. Firstly, the types with frequency ten or more represent only 9.4% of all types in the corpus. Secondly, if we expand the calculation to cover 45% of types and set the frequency threshold to 2, we will find only a third of the relevant types. The precision is low in both cases, which means that the students are using around one half of the target vocabulary taught in the courses, ranging from 42.4% to 53.3% for F = 10 and F = 2, respectively.

In order to balance precision and recall, we will calculate the harmonic mean between them called F-measure. F-measure is calculated as:

$$F = \frac{2 \times (\text{precision recall})}{(\text{precision} + \text{recall})}$$

which gives us a balanced measure between precision and recall:

$$F_{(2)} = 2 \times (0.533 \times 0.352) / (0.533 + 0.352) = 0.424$$

$$F_{(10)} = 2 \times (0.424 \times 0.885) / (0.424 \times 0.885) = 0.573$$

Figure 3 shows precision and recall and their variation according to type frequency. It is interesting to note that after the F = 3, i.e., excluding words that appear once and twice, the ratio between the precision and recall reverses. The F-score for the most relevant part of the graph (F between 2 and 10) is between 0.424 and 0.573, suggesting that the students' use of the goal words from the Textbook is on the lower side.

Figure 3

This Chart Shows Precision and Recall and their Variation According to Type Frequency
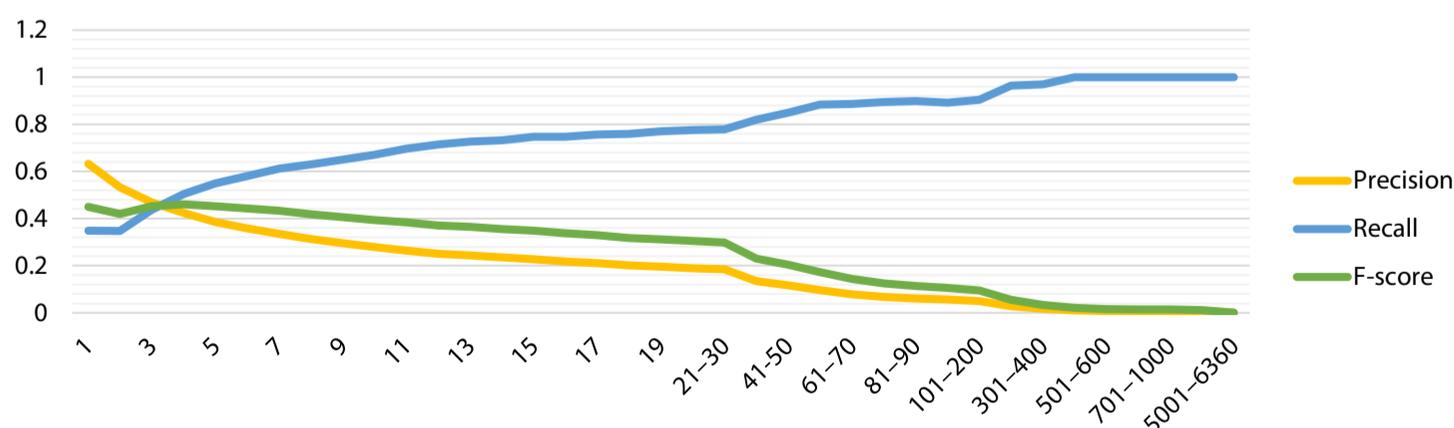
It is interesting to note that precision does not vary significantly whether we take into account the rare words with frequency three and above, or more common words, starting with frequency 10. Low precision, regardless of the threshold, signifies that most students' Tumblr posts might have

contained irrelevant information. If they are not writing about the materials taught in the classroom, what are they writing about?

For that reason, we are also interested in the null words list that represents the words that students used that were not taught in the class. Japanese University students in this context receive little to no exposure to English outside of the classroom. Therefore, null words give insight into the sources for which students are receiving information in English outside of the classroom as well as the tools students may be using to assist them in writing. The top 30 null words are listed in Table 2. The rank in the brackets indicates the frequency ranking of the word in the whole corpus. Following is a discussion of the inferences that can be made from observing the null words.

Table 2

The Top 30 Null Words

Rank	Type	Freq	Rank	Type	Freq	Rank	Type	Freq
1 (54)	delicious	216	**11** (122)	Christmas	99	**21** (211)	dance	55
2 (61)	because	199	**12** (123)	winter	98	**22** (222)	recently	53
3 (65)	also	189	**13** (144)	ill	77	**23** (225)	important	52
4 (78)	Halloween	160	**14** (152)	wearing	74	**24** (232)	costume	49
5 (99)	Okayama	113	**15** (155)	most	72	**25** (236)	Shinichi	49
6 (104)	thank	111	**16** (160)	Okinawa	71	**26** (239)	taller	48
7 (107)	test	109	**17** (164)	enjoyed	69	**27** (244)	student	47
8 (114)	his	104	**18** (179)	birthday	63	**28** (247)	lesson	46
9 (118)	ipu	102	**19** (191)	them	59	**29** (249)	these	46
10 (120)	club	101	**20** (202)	tired	57	**30** (250)	member	45

First of all, regarding input from outside of the classroom, the most frequent null word used was "delicious." Many students made posts about the food they had made at home or excursions to cafes and restaurants. It seems more surprising that the word delicious was not including on the FWL.

Second, the null words show many topic-specific words regarding students' immediate everyday experiences. Both the 5th and 9th most frequent null words from Table 2 show the acronym for the university and the prefecture where it is located. Further down the list in the top 100 words, as to be expected, nearby place names appear. In 16th place, Okinawa appears 71 times. In 32nd place, Osaka appears 43 times, in 55th place, Hiroshima appears 28 times, and in 76th place Kobe appears 24 times.

Furthermore, Lextutor provides a novel method of analyzing "keywords" in the text, here meaning the words which appear with high frequency compared to their overall frequency in the corpus. This method also ignored proper nouns and Japanese cultural words, giving us more insight into the content of their writings (the word *aeon* included in the keywords is a proper noun in Japan, a popular chain of stores and in this case, a large mall in the area). The nouns in Table 3 appear in singular form, and verbs in infinitive, but all forms from the same word family were counted.

Table 3

JTELC Top Keywords

(1) 6989.00 clothe	(11) 1398.00 relation
(2) 2995.50 firework	(12) 1398.00 professional
(3) 2995.00 athletic	(13) 1198.00 comedian
(4) 2796.00 especial	(14) 1198.00 bandana
(5) 2396.00 byte	(15) 887.50 Halloween
(6) 2396.00 meaning	(16) 799.00 judo
(7) 2197.00 okay	(17) 799.00 synchronize
(8) 1797.00 converse	(18) 799.00 pronunciation
(9) 1598.00 aeon	(19) 679.00 noodle
(10) 1398.00 princess	(20) 599.00 rollercoaster

We can see that students write about their interests and hobbies: shopping (*clothes, converse, Aeon* – name of the mall in Japan, bandana), free time (*fireworks, rollercoaster, comedian, Halloween*) and sports (*athletic, judo*). We can surmise that some of them might write about their English classes (*meaning, pronunciation*) or could be thinking about their future (*relation, professional*).

Comparing the JTELC with the FWL, some constraints appeared. First of all, the use of homonyms, such as "I hit a home run" and "I returned home," at the word level Lextutor is not equipped to handle this distinction and will count the word as a single type. Second, words like "American," which was included in the FWL to be taught as an adjective, sometimes occurred as parts of Japanese expressions like "American Joke." While the word would be counted as a shared type between the JLMC and the FWL, the use of this colloquial expression in Japanese, which could be considered to express culturally specific humor that either was not funny or humor that was not understood by a Japanese participant. The use of a culturally specific phrase like "American Joke" does not necessarily indicate that the student has learned, acquired, or can use the adjective American as a result of the first-hand course.

The N-Gram Extractor

The JTELC was analyzed using the N-Gram phrase extractor tool on **lex-tutor.com**. The tool allows for the extraction of phrases, up to six-word strings that frequently appear in a text. Here is a list of the top six-word, five-word, and four-ten most frequent word strings that appeared in the JTELC. The numbers in the square brackets in Table 4 represent the number of occurrences.

Table 4

Most Frequent Word Strings Listed by Length and Number of Occurences

6wd string	5wd string	4wd string
001.[16] I WANT TO **DO MY BEST**	001.[27] I WANT TO GO TO	001.[73] I WANT TO GO
002.[13] FOR THE **FIRST TIME** IN A	002.[20] THIS IS A PICTURE OF	002.[42] I WOULD LIKE TO
003.[08] WHAT DO YOU DO IN YOUR	003.[16] WANT TO **DO MY BEST**	003.[39] I WAS ABLE TO
004.[08] DO YOU DO IN YOUR FREE	004.[16] I WANT TO **DO MY**	004.[35] I WENT TO THE
005.[08] I WANT TO GO TO THE	005.[15] FOR THE **FIRST TIME** IN	005.[31] FOR THE **FIRST TIME**
006.[07] WHEN I WAS A HIGH SCHOOL	006.[13] THE **FIRST TIME** IN A	006.[31] WANT TO GO TO
007.[06] I WANT TO BE ABLE TO	007.[10] I'D LIKE TO GO TO	007.[30] I WANT TO BE
008.[06] I WILL **DO MY BEST** TO	008.[09] I WOULD LIKE TO GO	008.[29] IT WAS A VERY
009.[05] WANT TO **DO MY BEST** NEXT	009.[09] I WANT TO GO AGAIN	009.[27] THIS IS A PICTURE
010.[05] I THINK THAT IT WAS GOOD	010.[09] I WILL **DO MY BEST**	010.[27] I WANT TO DO

We can see from Table 4 that the students use two phrases (bold text) with an overwhelmingly high frequency: *do one's best* and *for the first time (in a while)*. The phrases do not come from the course material, but instead can be explained as Japanese cultural terms. The concept of doing one's best is lexicalized as a frequent Japanese word 頑張る(*ganbaru*), while the concept of first time in a while is, in fact, an awkward translation of Japanese phrase 久しぶりに (*hissashiburi ni*) which is much more frequent than the corresponding English expression. It is likely that a dictionary or translation software was used to translate the common Japanese concepts, and students, lacking input in natural English, failed to recognize the lexical gap.

Grammar-wise, it can also be noted that students used a lot of modal forms, such as *want to, would like to* or *be able to*. The increased use of modality can be attributed to the direct translating of Japanese grammar forms, where sometimes modality is used to soften the sentence, such as "I think I want to…" meaning "I will." To further explore this suspicion, we tried to reverse translate the phrases back into Japanese using Google Translate. 「頑張りたいと思います」(*ganbaritai to omoimasu,* "I think I want to do my best") resulted in the match "I want to do my best", the exact sentence frequently met in the corpus. Some of the phrases the students used a lot do come from the textbook material. We can at least see that students are using the titles from *English Firsthand* units and homework topics (*What do you do in your free time. This is a picture of…*)

Vocab Profiler

The vocabulary profiler tool allows for the sorting of lexical items based on frequency lists compiled from available word lists on Lextutor. The JTELC was analyzed using the frequency lists of the Corpus of Contemporary American (COCA) English and the British National Corpus (BNC). The result is a chart that displays words ranked by level of frequency of use. 69.6% of the words from the JTELC were high-frequency words coming from levels K1 (35.2%), K2 (23.3%), and K3 (11.1%). As would be expected, the percentages continue to decrease as the words become less frequent. The use of less frequent words by low-level students is curious and prompted further examination into the contexts that they were used. An example from the bottom of the list was chosen for the interesting examples, which are discussed according to Table 5 shown below.

Table 5

Frequently used words level K-20

Word Families (5)	Tokens (6)
biohazard	3
libero	1
Minny	1
syllabary	1
tempura	1

Biohazard is the Japanese title for the American zombie film titled *Resident Evil.* One student, in particular, liked this movie and wrote about it in their Tumblr post, "The biohazard is similar to walking dead, but it also has an interesting side to it."

Libero is the defensive position in volleyball. A student who likes to write about volleyball in their Tumblr posts wrote, "My position is *Libero*." *Minny* was a misspelling of the name Minnie. The student wrote, "I made a friend with cute *Minny*." This post was accompanied by a picture of an item that represented the Disney character Minnie Mouse. The student had misspelled the word and failed to include the object in the sentence.

Syllabary was most likely selected via translation. "I laik listening to music and hear Nishino

Japanese *syllabary*." This sentence was accompanied by a picture of the Japanese Pop Singer Nishino Kana. From this gap in meaning between the translation of the word "Kana," we can infer that this was an error in intelligibility caused by using translation software. However, the misspelling of the word "laik" is curious because it does not seem likely that translation software would produce this type of spelling error. It is possible that the student only partially translated this post.

Tempura, a type of Japanese cuisine, was used correctly as the post was accompanied by a picture of lightly fried vegetables. However, the sentence revealed a curious grammar error, "This is a Japanese Says the *tempura* very delicious." We may assume that this happened mistakenly. However, it reads as if the student was trying to reverse the roles of the consumer and the consumed for comedic effect. It is not uncommon that students intentionally try to use English in humorous ways.

This brief inquiry into the lower frequency words used by students reveals a few things. First that digital assignments that allow or require a picture can assist teachers in error correction because the picture provides added context to the student's intended meaning. Second, the use of fewer frequency words by low-level students does not necessarily mean that students are using methods of translation. As in the examples listed above, students are often using less frequent words to express specific cultural contexts.

Discussion

1) How much coverage of target language from the textbooks (lexical and grammatical) is covered in written student output?

At first, this seems easily determined. The task gets students writing as it is easily accessible and easy to finish. However, students treat it like answering a problem rather than an authentic writing experience that will get them to continue writing in English. Tumblr provides the feature to check when followed users have last updated their blogs. After the respective semester, at the time of writing, none of the students have updated their blogs. Also, as was found in the analysis using Text-Lex compare, coverage drops greatly when examined for repeated word use. Therefore, further emphasis should be placed on how to adapt the assignment to a focus that will encourage sustained writing and repeated word use.

2) What are the types and tokens of null and off words that students use?

Each unit includes a focus grammar point and words that students should use. Many of the examples of language use are abstract and present situations that are distant from students' everyday experiences. Of course, teaching materials developed for a variety of users must strike a balance between relevance and ambiguity to ensure adaptability for different learning contexts. However, the null words show that students are writing about their everyday experiences, places, and objects that are of cultural significance to them. Understanding the students' life outside of the classroom may help teachers to use their time more efficiently and to help make the text more relevant. The JTELC helps us to predict what students will write about, allowing us to adapt the grammar points and further customize the course for the students. Students do not always know what they need to know, and a good language course should also introduce new culture concepts related to the second language. As we observed in the vocab profiler analysis, students wrote about holidays like Halloween and Christmas when they were introduced in the class. The topic-specific writing suggests that a shift in focus to more concrete experiences, for instance what happened in the classroom, may be useful to students. We can use the target language from the textbook to write about what we have done or are doing now.

3) What can be inferred from the observation of student writing produced by beginners that appears to be unnatural or unintelligible to skilled users of English?

From this study, we can infer that students were using translation to write their blog posts. However,

without surveying or interviewing students, we can only guess what methods were used. Students could be using Internet searches, online or offline dictionaries, or phrases acquired before entering the class. However as was shown in the analysis, inquiries into the unnaturalness of learner language using corpora can help us to discover what unnatural collocations and phrases students are frequently using and how those differ from the target language. As was shown with "for the first time in a long time" and "I want to do my best" we can collect examples of common phrases that students overuse in their writing and provide students with alternatives before they begin their writing.

Conclusion

At first glance, we may assume that using microblogs to encourage low-motivated Japanese students to write in English was successful. However, with a view to the sustained acquisition of English writing skill, this study revealed some constraints that need resolution. Primarily, students in this context treat the writing assignments as a means to an end. The analysis showed that the students were able to complete the task successfully, but did not continue to practice writing beyond it. The dissipating frequency of words used from the textbook evidenced the students' myopic approach to the task. The words were used to answer the assignment but not with a view towards acquisition.

Furthermore, regarding the use of translation and translation software, we could infer the use of translation software in multiple instances across the JTELC, however without interviewing or surveying students, we could not confirm what tools students were using to accomplish this in detail. To gain a better understanding, further studies should include a component that confirms the specific uses of translation tools by consulting with students.

Finally, with a view to what students are writing about, the word use showed that students write about their everyday experiences inside and out of the classroom. The individual experiences of students at this university were reflected in their word use. Though in some cases, the frequently used words in this study may not be transferable to other contexts, the specific instances of null word use from this study give examples by which any English teacher in a JEFL context should be able to use before introducing similar assignments.

References

Apple, M., & Kikuchi, K. (2007). Practical PowerPoint group projects for the EFL classroom. *The JALT CALL Journal, 3*(3), 110–122.

Chen, S., Zhang, H., Lin, M., & Lv, S. (2011, December). Comparison of microblogging service between Sina Weibo and Twitter. In *Proceedings of 2011 International Conference on Computer Science and Network Technology* (Vol. 4, pp. 2259–2263). IEEE.

Chang, Y., Tang, L., Inagaki, Y., & Liu, Y. (2014). What is Tumblr: A statistical overview and comparison. *ACM SIGKDD explorations newsletter, 16*(1), 21–29.

Clement, J. (2018) Tumblr – statistics and facts. **https://www.statista.com/topics/2463/tumblr**/

Dowling, S. (2013). Using Blogs to Share Learner-Generated Content. *TESL-EJ, 17*(2), n2.

Fellner, T., & Apple, M. (2006). Developing writing fluency and lexical complexity with blogs. *The JALT CALL Journal, 2*(1), 15–26.

Foss, P. (2009). Constructing a blog corpus for Japanese learners of English. *The JALT CALL Journal, 5*(1), 65–76.

Granger, S. (2002). A bird's-eye view of learner corpus research. *Computer learner corpora, second language acquisition and foreign language teaching, 6,* 3–33.

Helgesen, M., Brown, S., Mandeville, T., & Kahny, J. (1999). *English firsthand.* Longman.

Izumi, E., Uchimoto, K., & Isahara, H. (2005). Error annotation for corpus of Japanese learner English. *Proceedings of the Sixth International Workshop on Linguistically Interpreted Corpora (LINC-2005)*.

Kimura, Y., Nakata, Y., & Okumura, T. (2001). Language learning motivation of EFL learners in Japan-A cross-sectional analysis of various learning milieus. *JALT Journal, 23*(1), 47–68.

Krashen, S. (1992). The Input Hypothesis: An Update. *Linguistics and language pedagogy: The state of the art,* 409–431.

Ministry of Education, Culture, Sports, Technology and Science (MEXT). (2015). *Plans on the promotion of improvement of students' English abilities.* Tokyo, Japan. **http://www.mext.go.jp/en/news/topics/detail/__icsFiles/afieldfile/2016/10/19/1378469_001.pdf**

Nihon'eigokenteikyōkai. (2019). Comparison table. Retrieved from **https://www.eiken.or.jp/eiken/en/research/comparison-table.html**

Perifanou, M. A. (2009). Language micro-gaming: Fun and informal microblogging activities for language learning. In M.D.Lytras, P. Ordonez de Pablos, E. Damiani, D. Avison, A. Naeve, & D.G. Horner (Eds.), *Best Practices for the Knowledge Society. Knowledge, Learning, Development and Technology for All.* WSKS 2009. *Communications in computer and information science, vol 49,* (pp. 1–14). Springer, Berlin, Heidelberg.

Tuan, L. T. (2010). Enhancing EFL learners' writing skill via journal writing. *English Language Teaching, 3*(3), 81–88.

Université catholique de Louvain (2019). Learner corpora around the world. **https://uclouvain.be/en/research-institutes/ilc/cecl/learner-corpora-around-the-world.html**

Author's Information:

Robert Anthony Olexa, lecturer in the Child Development Department at International Pacific University in Okayama, Japan. He is a graduate of the MS Ed program at Temple University Japan Campus and author of several children's books. His research interests are multilingual comedy, language learning in virtual reality, and teaching English to young learners.
Email: **r.olexa@ipu-japan.ac.jp**.

Sara Librenjak, lecturer in the International Education Department at International Pacific University in Okayama, Japan. She has an MA in Linguistics (Computational and Cognitive linguistics module), and is working on a PhD in Information and Communication Science. Her research interests include corpus linguistics, CALL and technology in language teaching.
Email: **s.librenjak@ipu-japan.ac.jp**.

13

Speaking with Your Computer: A New Way to Practice and Analyze Conversation

Gary Ross, Kanazawa University
Stephen Henneberry, The University of Shimane
Glen Norris, Ishikawa Prefectural University

Abstract

In recent years, the increase in the availability of speech recognition, speech synthesis, and tools which harness them, has led to exciting possibilities in the field of foreign language teaching. This study discusses the current advances in these technologies and how they have become ubiquitous through the use of Siri, Alexa, and other such tools. While these tools have done much to increase awareness of simple oral computer interfacing, we focus on the use of Web Speech Recognition API to develop an oral communication practice interface for language study. This website was created by the primary researcher in the current study and allows students to receive real-time feedback on L2 utterances completed via the website interface. This gives students the opportunity for speaking practice outside of the classroom, complete with feedback. All student utterances, transcriptions, and scores that the tools attribute to them are saved to a database for later analysis. Additionally, instructors have access to data on student participation and levels of success. The current study is based on data from approximately 300 students of English as a foreign language from three universities in Japan.

近年の音声認識や音声合成などのテクノロジーの可用性の増加、及びこれらを利用する媒体の増加が外国語学習の分野で新しい可能性を生み出している。このショー・アンド・テル形式のプレゼンテーションはこれらのテクノロジーの近年の発展及びSiri やAlexaなどのツールの使用を通した普及について述べている。上記のツールは単純な口頭でのコンピュータとの干渉に使われているが、この科研では Web Speech Recognition API を使用した言語を学ぶための会話練習を可能にする仕組みを作成することに視点を当てている。この研究の主となる研究者が作成したウェブサイトは、学生がリアルタイムで第二言語での発言に対するフィードバックを得ることができる。学生による全ての発言とその文字起こし、及びシステムがそれを評価した点数はデータベースに保存され、後々分析することができる。このウェブサイトは生徒が授業外で会話練習をする機会を増やし、同時に添削されることも可能にしている。それに加え、教師には生徒がこのツールを使う頻度や進展具合にアクセスする権限があり、生徒の活動や進歩を確認することができる。現在この研究は約300名の日本で英語を外国語として学んでいる生徒を元に進められている。

Keywords: **Speech recognition, speech synthesis, online speech, API**

Computerized speech consists of two core components: *speech synthesis* and *speech recognition*, which broadly enable a computer to vocalize and transcribe human speech. A third component, which serves as an artificial "brain," enables a computer to respond appropriately to spoken interactions. Current tools available for computers, smartphones, and home devices leverage this third component to provide users with simple replies to simple queries. Apple's Siri, Amazon's Alexa, and Google's Home all use speech recognition and synthesis to interact with users. However, these tools are limited to the simple pattern of question and response. Current systems simply have not progressed to the level required for the complexities of normal daily conversation.

Speech Synthesis

The specific goal of speech synthesis is for a computer to audibly reproduce text as a human might produce it. Since human speech is not merely the sound of individual words strung together, this represents a considerable technical challenge. Early attempts were completely unnatural sounding: Stephen Hawking's synthesized voice is a famous example. Recently, technological advances have allowed voices to sound much more human. However, such systems still struggle with the nuance of human speech, especially intonation, and can be fooled by heteronyms (words with the same spelling but different pronunciation and meaning):

- She *wound* the gauze around his *wound*.
- The *tear* in the canvas brought a *tear* to the artist's eyes.

An important corollary of these examples is that humans are able to produce the correct pronunciation due to their semantic understanding of the sentences in question. They know "wound" means "wrap" and "injury" respectively whereas machines tend to use a heuristic approach to discern that "his wound" is a noun phrase rather than a verb phrase in order to produce the appropriate output. This heuristic approach can be further extended to intonation. However, due to the complex nature of the English language, machines still have difficulty parsing meaning, and producing the correct pronunciation, in such situations.

Speech Recognition

Speech recognition has the goal of converting human speech into readable text. Depending on the specific application, the system may also have the goal of adding punctuation to the speech. Unlike speech synthesis, early efforts at recognition performed extremely poorly. Some systems, such as IBM Shoebox could recognize a limited number of words spoken slowly, such as integers, or could process short sentences with limited accuracy (IBM, 2011a). Later, dictation systems became more accurate, having been trained by the speaker, and thus were able to transcribe with reasonable accuracy the speech of a single individual (IBM, 2011b).

However, the recent rise in the use of spoken interaction with computers has given deep learning systems access to billions of utterances from millions of unique users. These utterances, captured by Apple's Siri, Google Assistant, or Amazon's Alexa, have resulted in immense improvements to the capabilities of current speech recognition systems, allowing for more immediate and accurate transcriptions of spoken input (IBM, 2011a).

Conversational Ability

The ability for a computer to produce natural humanlike conversation has long been regarded as the holy grail in the development of artificial intelligence. Indeed, the famous Turing Test (Turing, 1950) involves determining whether a machine could produce a natural conversation indistinguishable from a human speaker. The idea of a speaking and thinking machine has captured the imagination for generations in both literature and film: Isaac Asimov's Mulitivac (1956), HAL in 2001: A Space Odyssey (Kubrick & Clarke, 1968), and Roy Batty in Bladerunner (Scott, 1982) are well-known examples.

Today, virtual assistants such as Siri and Alexa respond immediately and audibly to requests and queries allowing users to carry out commands and find information. Simplistically, we could say that such systems attempt to interpret the intention of the user and respond accordingly. The effectiveness of these systems tends to be anecdotal, but most users will note a combination of frustration and effectiveness in their use. Indeed, part of their "personality" is a deflection of any controversy and humorous responses to deep questions.

Figure 1

Siri Dreams of Electric Sheep: An Example of Pre-programmed Humorous Responses to Deal with Creative Questions without Factual Answers

Recently, Google introduced Google Duplex: an AI assistant for making business appointments, such as at the hairdresser (Leviathan, 2018). Judging by the audience's response in a YouTube video of the live presentation (Grubb, 2018), the machine acted spookily human. While this kind of interaction seems to demonstrate a humanlike ability to converse, it should be noted that these are very closed situations with specific predetermined goals, and thus represent a tiny sliver of how humans actually interact. Additionally, it is worth noting that in the second example of Google's own demonstration the tool failed due to its inability to navigate communication with a non-native speaker. Furthermore, the fact that a company with the resources of Google, continuously utilizing thousands of computers to generate the neural network, can only produce extended natural conversations in such specific instances gives an indication of the challenges involved.

Thus, it should be noted that while *open-ended* computerized conversations may be a possibility in the classroom in the future, they are not a realistic possibility today, and thus any pedagogical approach to speech in the language classroom needs to work around this limitation.

Natural Language User Interfaces and the Web

As a result of the technological advances noted above, natural language user interfaces (LUIs) such as Siri and Alexa are gradually being adopted as an alternative/augmentation to traditional touch interfaces such as a mouse and keyboard, or a touch-screen.

This change in human-computer interaction is highly significant in the language classroom. If an instructor decides to use an LUI such as Siri in the classroom (assuming all students are using iPads), there is no way for the instructor to access the transcripts, as Siri is a proprietary system owned by Apple. On the other hand, a speaking and listening system using the Speech and Recognition Web APIs allows access to all the data produced.

The World Wide Web (the Web) has long been a driving force in adopting such accessibility technologies. Tim Berners-Lee (1989) invented the Web to be a device-independent collection of information that was accessible to all. This is especially true of allowing the web to be accessible for users with disabilities. A speech-driven interface is invaluable to users with mobility issues, or to blind users who may otherwise find it impossible to access or effectively use websites. (Note: The Web in this article refers strictly to the World Wide Web; i.e., the collection of websites that have a URL and can be viewed

in a browser, such as **https://jaltcall.org/**. Mobile applications, etc. are part of the Internet but not the Web.)

Thus, the W3C, the standards body that oversees the Web, have defined both a speech Recognition and Speech Synthesis API:

> This specification defines a JavaScript API to enable web developers to incorporate speech recognition and synthesis into their web pages. It enables developers to use scripting to generate text-to-speech output and to use speech recognition as an input for forms, continuous dictation and control. The JavaScript API allows web pages to control activation and timing and to handle results and alternatives (**https://wicg.github.io/speech-api/**).

Browsers such as Chrome, Safari, and Firefox, etc. are *expected* to implement these APIs in order to allow web developers to create more accessible websites (W3C, 2017). Should a web developer want to give a user the ability to speak to a webpage and have that speech transcribed, the browser should have the ability to do so. Equally, a webpage should be capable of using text-to-speech technology to allow access to blind users.

As noted previously, although browser manufacturers are expected to implement these technologies, in practice they do not always do so, and the support, speed, and accuracy of these APIs will vary between devices.

Present Support

The website *Can I Use* (**https://caniuse.com/**) gives up-to-date information regarding support for HTML5 technologies. For speech synthesis (text-to-speech technology) there is broad support across browsers and devices, meaning that developers can create websites that enable the browser to speak to the user on most major desktop and mobile operating systems. The situation regarding speech recognition is more complicated. Essentially, the only browser on the desktop that supports speech recognition is Google Chrome. This limitation is not overly serious in a bring-your-own-device classroom: it simply means requiring students to install Chrome onto their PC. Chrome is a popular browser, so this presents few problems. In locations dependent on computer rooms or language labs, where admin access and software installations are decided by committee, the situation may be more challenging.

However, access via mobile devices is not as simple. The only browser that has support on mobile is Chrome for Android. This presents a much more serious issue as it means that any web-based system will not work on any iOS device: iPhone or iPad. The issues created by this limitation will be addressed later.

Figure 2

Image from Caniuse.com Showing Google Chrome's Support of Speech Recognition Technology

Can I use   speech recognition   ?   ⚙ Settings

1 result found

Speech Recognition API 🗎 - UNOFF

Method to provide speech input in a web browser.

Usage
Global

unprefixed:

% of all users   ?

0% + 68.9% = 68.9%

0%

Current aligned   Usage relative   Date relative   Apply filters   Show all   ?

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Blackberry Browser	Opera Mobile	Chrome for Android
		2-21	4-24		10-26						
6-10	12-17	22-67	25-75	3.1-12	27-60	3.2-12.1		2.1-4.4.4	7	12-12.1	
11	18	68	76	12.1	62	12.3	all	67	10	46	75
	76	69-70	77-79	13-TP		13					

How Does Chrome's Implementation Work?

As noted previously, the Speech Recognition API implementation is defined by the W3C standards organization. In practice, the workings of these APIs are developed by a team of experts in browser technologies in consultation with major tech companies like Google, Apple, and Microsoft. While the W3C standards are recommendations, it cannot force companies to implement every technology. Indeed, certain APIs have in the past been abandoned when it became clear that one or more major companies would never support them (Calore, 2009).

In the case of the Speech Recognition API, Chrome's support is fairly solid. Once Chrome has been given permission to access the microphone, one can speak to the browser as instructed by the interface. In Chrome's case, the browser sends the audio to Google's server to be processed in real-time, and Google sends the transcribed text back to the browser. The text can then be displayed, and if desired saved to a database.

It would be breaking the W3C specs if Google were to send back the text while having the browser prevent you from saving the data to your server (Github, 2019a) This is an important consideration when developing such systems for students, as the Web Speech API implementation will work in a predictable and open manner (W3C, 2017). Importantly, this allows instructors and developers to keep control of the data they themselves have produced.

However, the specification does not state what Google can or cannot do with the sounds that it receives on its servers – this would be determined by local privacy laws such as the GDPR recently implemented by the EU (EU GDPR, 2018).

A detailed technical discussion of how the API works is beyond the scope of this article, but it allows the developer to customize attributes for data input, processing, and output (Github, 2019b). Such attributes include language selection and input continuity: will the browser listen forever until the user intervenes, perhaps by clicking a "stop" button, or will it assume the utterance is complete upon one second of silence? The settings in the API give the programmer control over how the user can interact with the system.

An example of the HTML Speech API in a browser, programmed by the primary author, is shown in Figure 3. In this example, the transcription of two spoken utterances is displayed in the text box. The first line, reading: *The best way to predict the future is to invent it,* was spoken into the microphone using English. The second line was spoken into the computer after changing the input language to Japanese. The interface successfully captured the Japanese phrase "日本語にしましょう" despite the author's non-native pronunciation. Due to the limitations of the system, this required two distinct interactions, as the API requires the language to be specified in advance.

Figure 3

Speech Recognition Can Be Used for Multiple Languages; Speech Synthesis Supports Different Voices and Accents
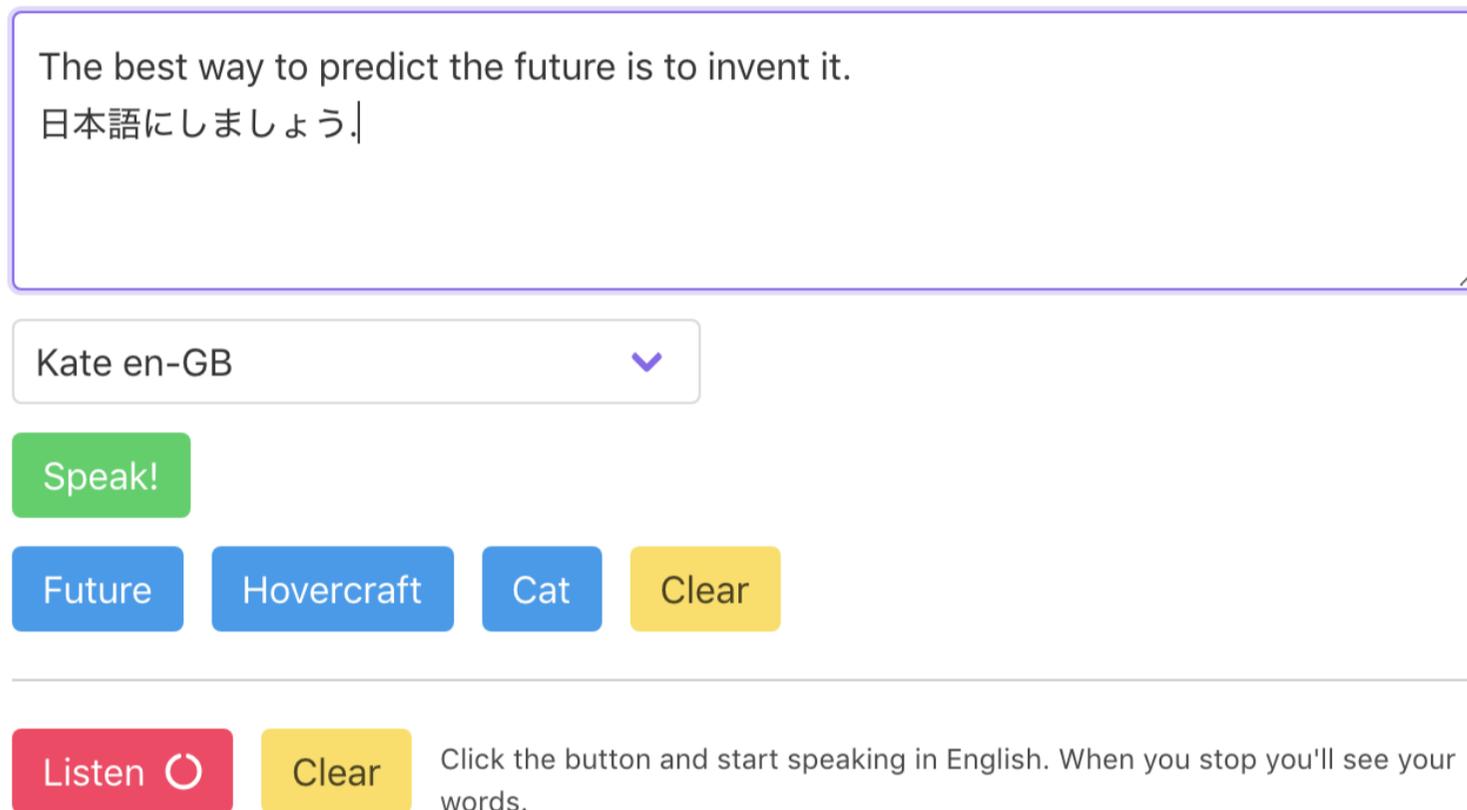
Computerized Speech in the Classroom

In order to ascertain the potential benefits and pedagogical approaches of Computerized speech in the ESL classroom the lead author developed a web-based speaking practice system for use in the classroom using the Web Speech API. This system was also used at Ishikawa Prefectural University by one of the co-authors.

Basic Overview

Lack of spoken practice in the Japanese L2 classroom is a severe impediment to English education. Despite structural attempts to improve this situation, cultural issues and student confidence, as well as other obstacles, make it difficult to overcome (King, 2013). The situation at present could be compared to a music class of dozens of students learning to play the piano, with out-of-class work focusing on studying materials on the mechanics of how a piano works, while never actually touching a real piano, let alone playing one. In such a situation, it would not surprise anyone that such a course would not produce any pianists, yet this broadly matches how Japanese students attempt to learn to speak English.

Clearly, there are differences between learning the piano and learning to speak English. In the latter case, students may not be motivated to learn a language, or may lose motivation due to difficulty recognizing their own progress. Even in the classroom students may not be able to get feedback from a teacher on all of their L2 utterances, and therefore lack awareness of progress. And how can students receive feedback on speaking tasks outside of the classroom? Furthermore, a homework assignment for English may require a form of assessment which traditionally is not easily possible with a spoken assignment.

Thus, the preliminary focus of this project was to simply get Japanese students to speak more outside of the classroom and ascertain whether such activities could be graded. The system at present uses two basic activity types: (1) role-play and (2) drilling. Other possible pedagogical approaches will be discussed later.

1. Role-play Activities

In the role-play activities, the website presents students with scripts to follow. Students take on one role while the computer takes on the other. The tool created by the author currently includes two role-play models: scripted and open-ended. In the scripted role-plays students are provided with complete scripts of multiple speakers. Students can take on either role in these activities. The open-ended role-plays allow for more freedom, and students must reply to question without scripts.

1a. Scripted Role-play

In the scripted role-plays, the website would present the student with a complete script. Students are able to take on either role for a more complete practice. For example, in the following activity, which is a scene from the 1985 film, The Princess Bride (IMSDb), the student takes on the role of Vizzini (3 utterances), whilst the computer takes on the roles of Montoya and Buttercup, outputting their voices using the Speech Synthesis API.

When it is the student's turn to speak, their dialogue is highlighted: the screenshot below shows the student midway through the activity being prompted to say, "*That would be inconceivable.*"

Figure 4
Role-play Activity Using the Online System Created by the Primary Researcher

|	
v Why are you doing that?	💬 Vizzini
	💬 Montoya
m Making sure nobody's following us.	💬 Buttercup
	Just Listen
v That would be inconceivable.	💬 Play All
b Despite what you think, you will be caught.	
m You are sure nobody's following us?	
v As I told you, it would be absolutely inconceivable.	

When the activity is complete, feedback is presented to the student in the form of a transcript, returned via the Speech Recognition API, together with a score. (The algorithm for generating the score is discussed later.) The resulting output would look as in Figure 5.

Figure 5

Completed Role-play Activity Showing Student Scores
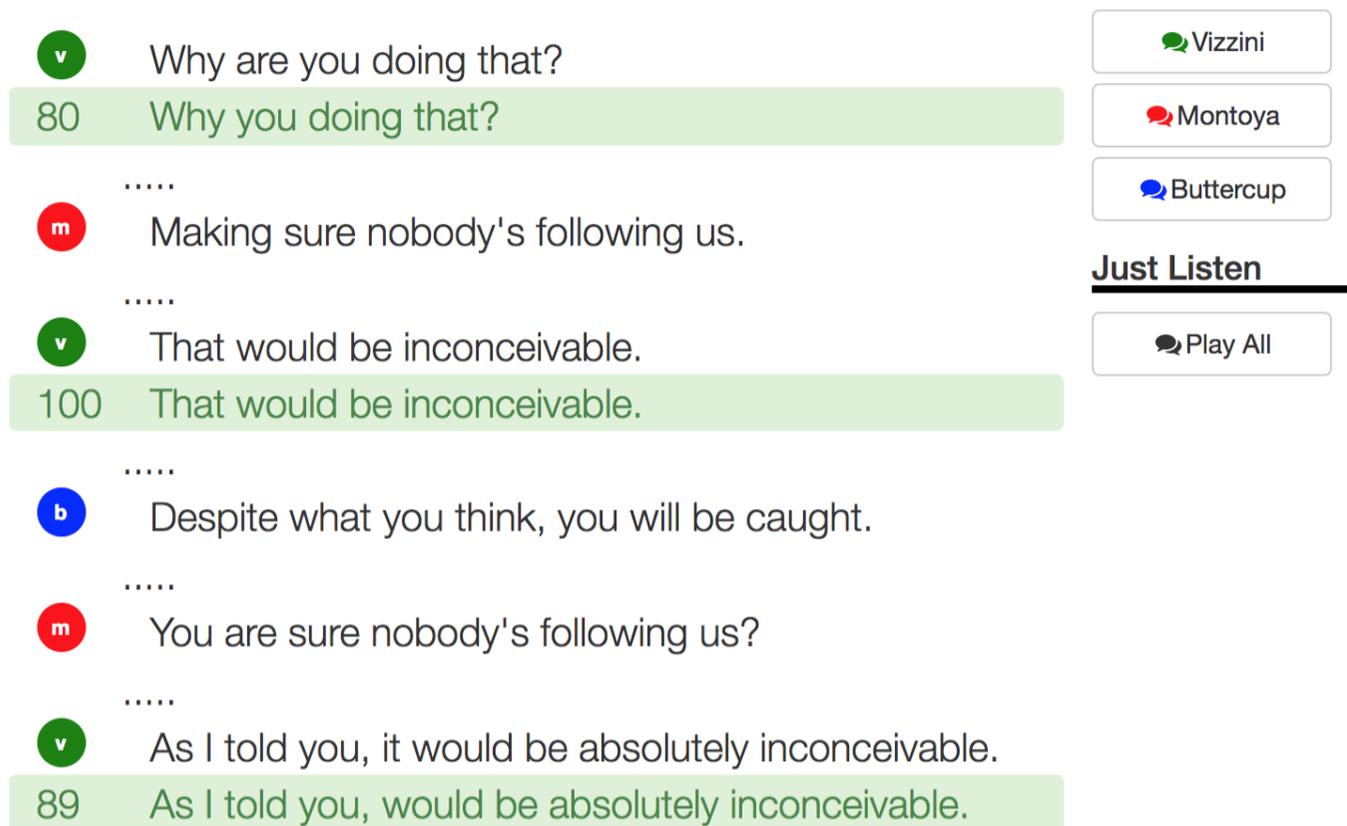
It should be noted that the conversation happens automatically. Once the student starts speaking, the computer will take over as soon as it detects a pause, and will then wait when it is the student's turn to speak. This can occasionally cause issues if the student pauses too long mid-sentence, as the computer will assume the student has finished speaking. This becomes part of the challenge, as students learn that successfully completing the task successfully requires fluency.

Note also that each utterance has been scored. The first and last utterances are missing words, thus reducing the scores. Details of the scoring process are discussed later in the paper.

1b. Open Role-play.

While the scripted role-play above is a clip from a movie, instructors can, of course, devise role-plays for any situation. In the case of the Pharmacy Faculty at Kanazawa University, the author often has the students role-playing open-ended pharmacy-patient situations such as the following example with the student acting as a pharmacist and the computer acting as the patient:

Student: Good morning. How can I help you?
Computer: I have a prescription from the doctor.
Student: Here you go. This is ampicillin for your ear infection. I'll just explain the directions.
Computer: OK.
Student: Please take two tablets, three times a day, after each meal for seven days.

In such situations, the student can be first required to read the text, but on later practices, the text disappears and the student is free to respond how they like. For example, in the above example, the students could be encouraged to change the illness and the medicine, as well as prescribing

directions to match what they have been taught in their actual pharmacy course. How such practices would be scored is outlined below.

2. Drilling

In a drill practice, the student is presented with a basically predictable dialog and is required to give the correct response to a prompt. Repetition is a well-known language learning technique. An example would appear on the website as follows.

In the "passive practice" example below, there would be three distinct practice forms: (i) speak the A sentences, (ii) speak the B sentences, and (iii) speak the B sentences *but with no visible prompts* – just the computer speaking the prompts.

Figure 6

Drilling Activity Using Set Dialogs: Students Practice Speaking Both Questions and Answers

🎤 Practice   📄 Score   🔊 Audio   ❓ Help

|	
A	Who wrote Satisfaction?
B	Satisfaction was written by the Rolling Stones.
A	Who discovered Penicillin?
B	Penicillin was discovered by Fleming.
A	Who developed the vaccine?
B	The vaccine was developed by Jenner.
A	Who invented the lightbulb?
B	The lightbulb was invented by Joseph Swan.

Practice (i): The practice above gives students a chance to "interview" the computer. They ask the computer questions, and receive replies in turn. While the scripted replies are returned regardless of the student's performance, the students are given practice in interacting orally outside of class in a non-judgmental environment.

Practice (ii): Having heard the prompt spoken by the computer, "Who wrote Satisfaction?" The expected response would appear as shown in Figure 7.

Figure 7

Visual Prompt: Students Must Read the Response Aloud
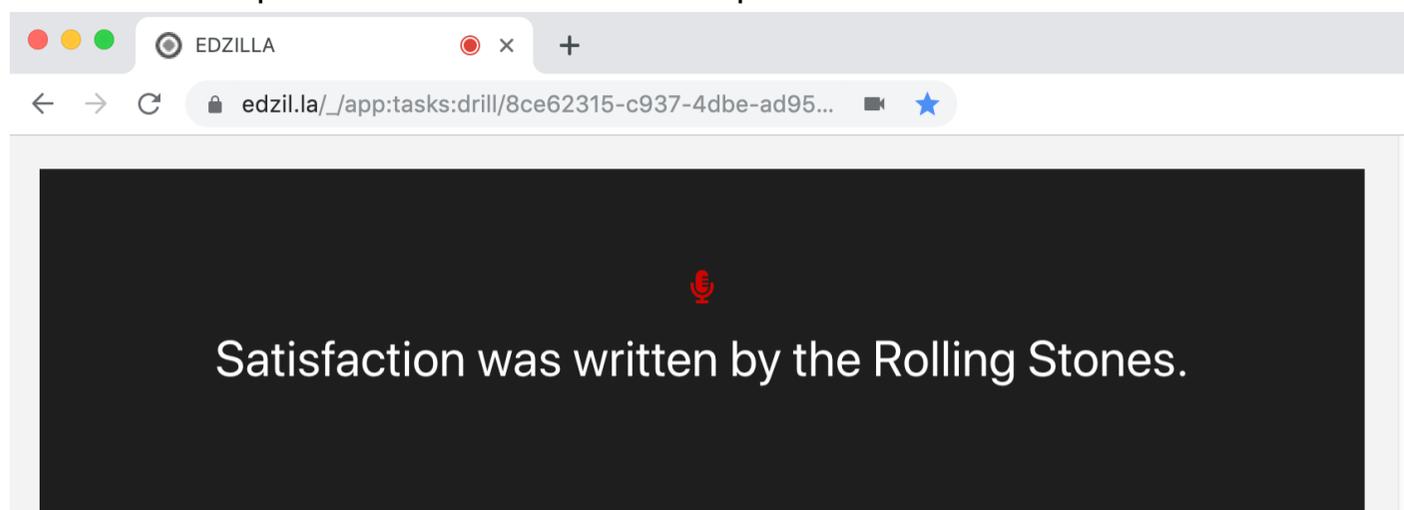
In the situation shown in Figure 7, the students become the interviewee. They are able to practice replying to questions in English in a time and place of their choosing. They can practice the interaction a number of times and strive for better assessment by the online tool.

In practice (iii) shown in Figure 8, there is no written prompt. The student hears the computer say, "Who wrote Satisfaction?" and speaks the response. The microphone indicates when the student should speak.

Figure 8

Visual Prompt: Students Must Remember the Reply from Previous Practice
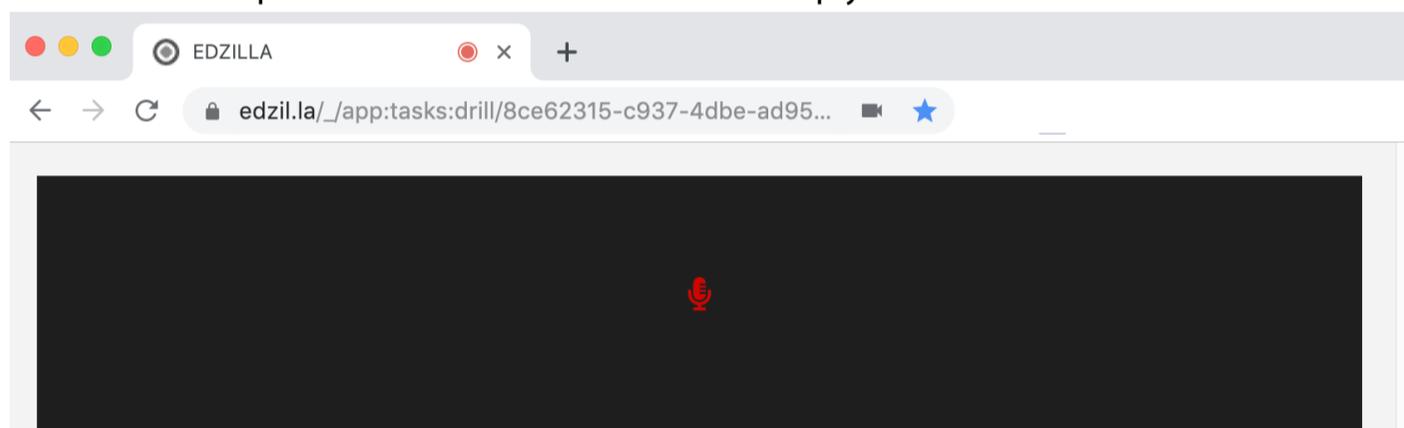
This third activity allows students to demonstrate to themselves that they can reply without "reading along." While this is certainly not a demonstration of fluency, it could give students a chance for a boost in confidence after their previous practice with the text visible.

Having completed the third activity, the output would appear as follows in Figure 9. Here the speaker has mistakenly replaced "The Rolling Stones" with "The Beatles." The reason for the 100 score despite the error is explained in the next section.

Figure 9
 Feedback Screen: Student has Responded to the Drill Questions/Prompts
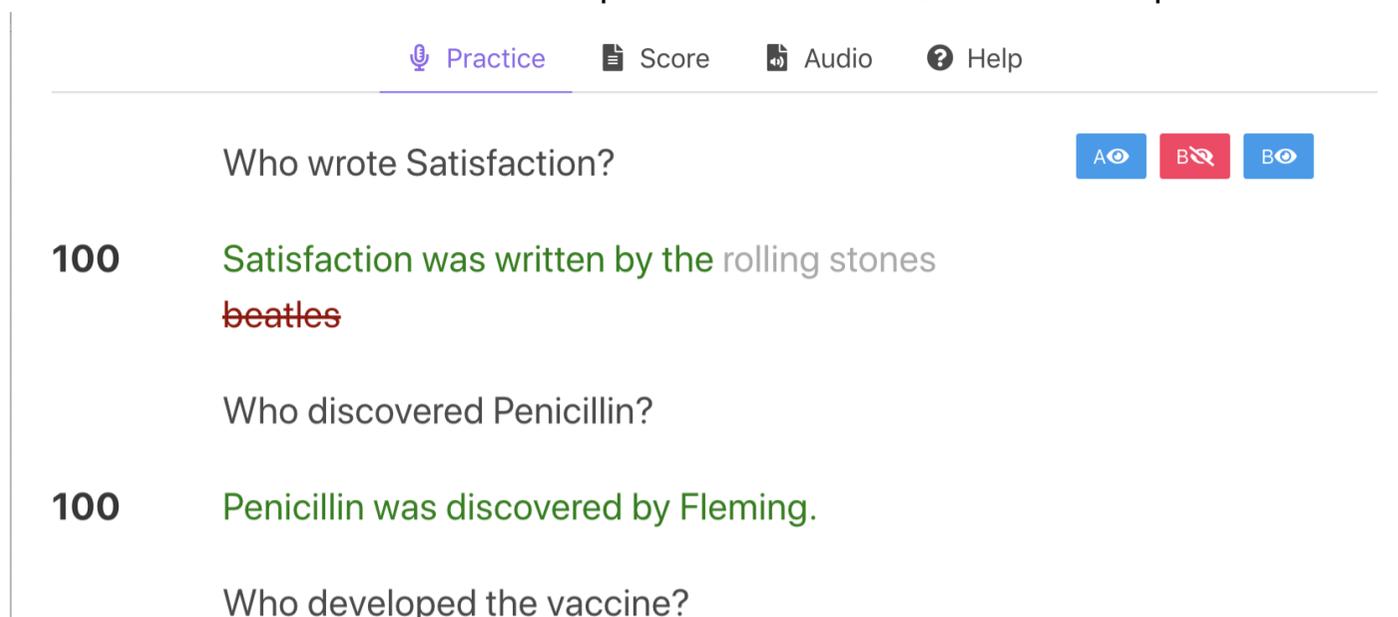
Criticisms

 An occasional objection to the role-play and drill system is that students are "merely" reading the text. While this is true for some of the role-play activities, it does not mean that such activities are without merit. As noted earlier, many Japanese students do no speaking practice outside of the class-room *at all*. Repetitive practice is a common and accepted form of improvement in all sorts of skillful endeavors. There is a reason that even concert pianists practice their scales.

 It is also not entirely true that students are reading the responses. While some of the activities do involve reading, it is possible to develop spoken practice activities where students can respond as they like within a certain framework. In a pharmacy-patient interaction, the student can change the medicine, the dosage, and advice, and in the passive practice shown in Figure 8, the responses are invisible to the student. Imaginative drills and role-plays can be devised that feel relevant to the student despite their somewhat closed nature.

Scoring

 This section discusses two issues: (i) possible scoring algorithms and whether scoring is necessary at all, and (ii) how it should be used.

Scoring Algorithms

 A simplistic "accuracy" algorithm was developed as demonstrated in Figure 4 which essentially gives a score on how many words the student gets correct. Students who get six out of eight words, for example, would score 75%. Extra words would also incur a "penalty." In other words, speech recognition transcribes what it determines the student is saying, and the closer the transcription matches the actual words of the target sentence the higher the score.

 There are a number of issues to be noted, however: the first is that speech recognition is not a purely sound-based system. The Google or Siri recognition heuristic may apply language pattern rules to predict what a native speaker is probably saying to better deal with poor sound input caused by background noise, poor connectivity, etc. Since the major speech recognition systems are proprietary at present, the specific approach for dealing with non-native speakers of varying accents in not known.

Anecdotal evidence shows that Google Assistant is moderately successful with words in isolation for varying fluent non-native accents suggesting that sound alone is the major heuristic approach.

Furthermore, in an open role-play activity, the word comparison scoring algorithm is not possible as there is no target sentence. However, there is another possible approach. The Speech Recognition API specifications also give a confidence score ranging from 0 to 1 (Github, 2019c) based on how sure the engine is of its transcription accuracy. A native speaker will tend to get scores near 100% regardless of what they say. On the other hand, non-native accents tend to get lower confidence levels. This is another approach to scoring: simply give the student the confidence score. The obvious disadvantage of this approach is that a student could simply respond, "hello" to everything likely getting a high score – although this can be detected through examining student word counts in the logs.

Figure 9 shows an example of a confidence algorithm score as used by a native English speaker. Despite the "Beatles" error, the answer was spoken fluently thus scoring 100.

Scoring Necessity and Grading

The question arises as to whether scoring is necessary at all. Or more pertinently, whether the student needs to see the score. As we will see later (in the text analysis section) recording the confidence score and the "accuracy" score is very informative for the *instructor*. However, we should ask whether the *student* needs to see the score, and how the score should be used.

Further research is needed, but initial findings through student interviews and questionnaires overwhelmingly demonstrated that students wanted to see their score. "If I get a low score, I try to get better" was a typical reason given in support of scores. However, some did note frustration with scores: "Sometimes I cannot get a high score," but even amongst these students the lower score tended to motivate them to try harder. The "cold" analysis of a machine giving them a 72% ironically seems motivating compared with inconsistent and usually non-existent human feedback.

What we have found to be effective is telling the students that the score has no impact on their grades: simply that a lower score requires them to repeat the activity more often. Therefore, if the student is required to carry out the activity 10 times, then a student who consistently scores 80% would ultimately need to carry out the activity 12 or 13 times. Completion of the activity is all that is required. (The system has a "safety" whereby no student needs to do more than double the required work, whatever their score might be.)

This non-grading but scoring approach is important: the scoring is *feedback*, not a grade. The goal here is to encourage the students to practice and thus ultimately improve, and completion of the required number of practices is the goal – not getting a perfect score each time.

An example of a student's progress in the Passive practice is shown here in Figures 10 and 11. In Figure 10, the student is required to do each of the three passive practices four times. In Figure 11, the student has completed all three parts of the activity.

Figure 10
   Blue Line Indicates that the Middle Practice is Complete; Black Lines Indicate that More Practice is Required
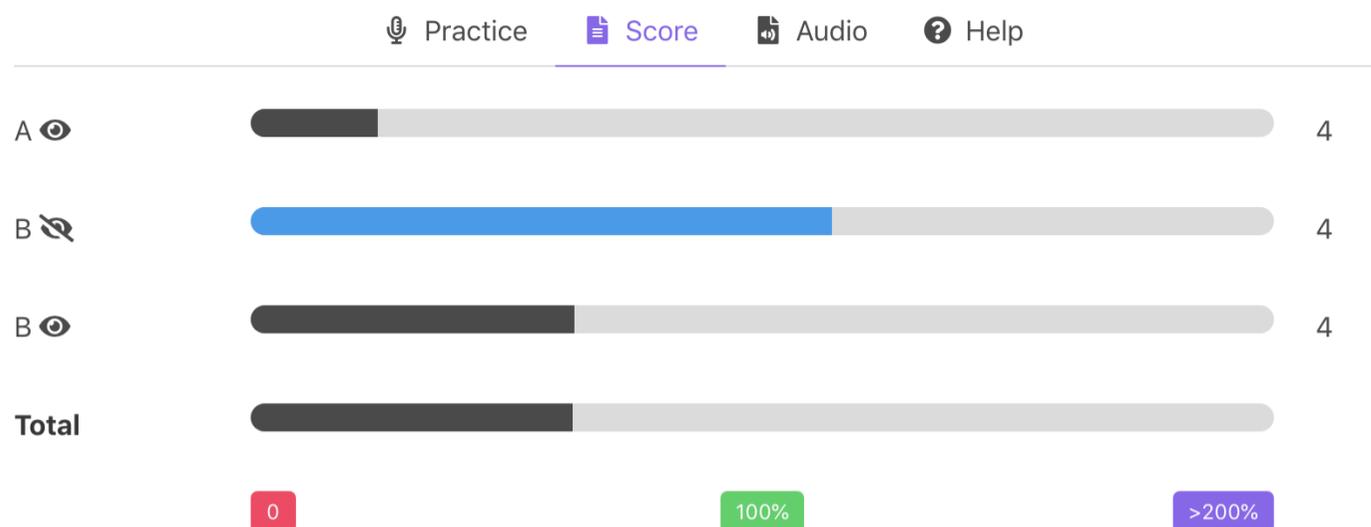

Figure 11
   The Three Practice Bars are Blue, and the Overall Practice Bar is Green
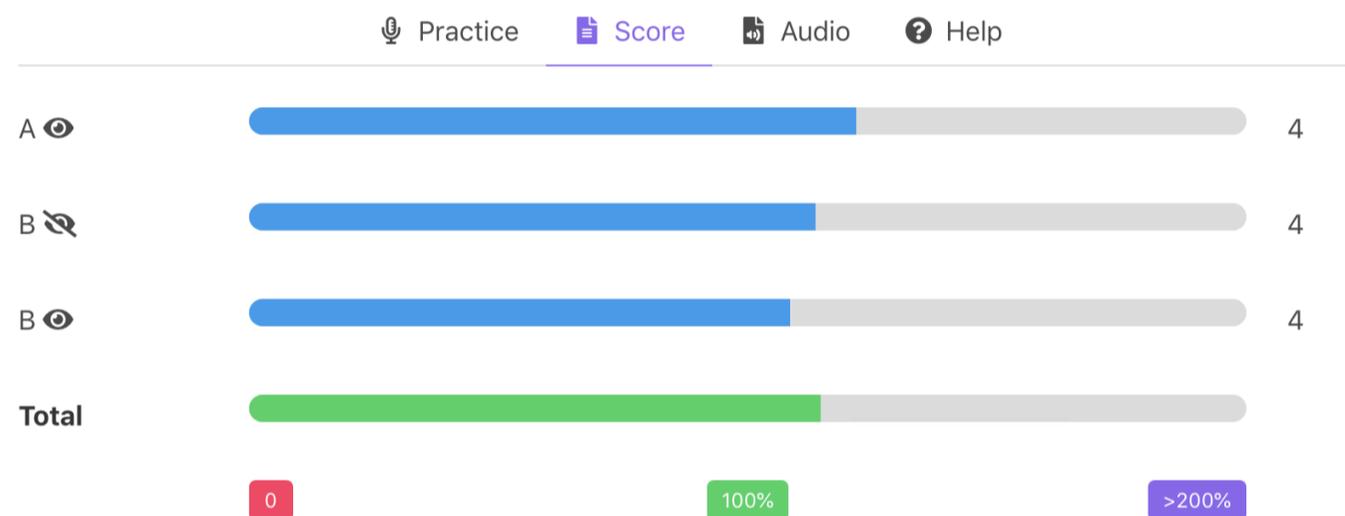
Text Analysis

Transcription is perhaps the most significant aspect of speech recognition. Since every utterance is transcribed to a database, trends in the speaking patterns of students can be ascertained. For example, in a drill-type activity, the words that cause the most problems can be discovered. In an open-type activity, over-reliance on stock patterns, phrases, and even constructions can be discovered. In theory, this analysis can be performed on millions of utterances: a powerful analysis tool, which will be part of future research.

An example of an analysis output is shown below in Figure 12 in a role-play between a pharmacist (underlined black bar) and a patient. The N indicates how many times each utterance was spoken by the class in total. So "Mr. Lee" was spoken 526 times, and "Yes" was spoken 111 times. (In this activity, the students were required to play the pharmacist more often than the patient hence the difference.)

Even in this short example, the instructor can discern information that would be impossible without speech recognition:

i) Japanese students struggle with "Mr. Lee" probably reflecting the R/L issue. Another possibility is that the Recognition API has problems with non-contextual sentences with names. In this case, a future practice may be better using a more common name.

ii) "He said that I have to carry these at all times" scored less than "Do you know how to take this medicine?" This is an intriguing result as there is no apparent reason why this should occur. The power of speech recognition reveals itself because the instructor can look at each sentence the students produced, and a cursory glance at the data showed that the Japanese students struggled with *"these"* often saying *"this"* instead, and that the word *"carry"* also presented difficulties. This quick analysis is invaluable to the instructor and is only possible through the locally stored transcriptions of student speech recognition utterances.

The students themselves through the feedback mechanism would also see that they were saying "this" instead of "these" and thus making an effort to correct it.

Figure 12

Analysis of Student Outputs Showing the Average Accuracy of Each Utterance

Type	N	Mean
💬 Mr. Lee.	526	48.7%
💬 Yes.	111	97.2%
💬 Do you know how to take this medication?	535	92.8%
💬 He said that I have to carry these at all times.	114	74.3%

Preliminary Research Results

We are at present carrying out analytical studies for the effectiveness of speech recognition in the EFL classroom – the results of these studies will be published in detail in a separate paper. In our initial study, 34 students in the same class were compared depending on whether they had or had not been assigned a particular spoken practice similar to the passive practice above with the total practice time being around 30 minutes. Despite the short duration of the practice, the intervention group tended to score higher on a short test: 81% for the practice group while the non-practice control group scored 72% ($p = 0.067$). While this result did not quite attain significance, nonetheless it does suggest that such practices may result in a tangible increase in ability even with minimal practice time. Further, research will be carried out in this area.

Discussion

As speech recognition and speech synthesis technologies have been only recently accessible to developers and educators, there has been little detailed study into their effectiveness and the future possibilities in the EFL classroom. However, the early stages of implementation have resulted in encouraging results. As students have become reliant on such tools in their L1 computer/smartphone usage, familiarity with the process has simplified the implementation of the tools in the language classroom. This, coupled with the personalization options available, where students can choose which genders and accents to interact with, has allowed for a broader range of practice for L2 students. Students

get a fuller range of input from voices of their choosing, and are rewarded with immediate automated feedback on their progress. The technology also enables scaffolding techniques, such as slowing down the speech or selecting portions to be read, allowing students to customize the practice to suit their abilities.

For the teacher, conversations are quick to produce as one can simply type the conversation into a web form rather than spending valuable time producing recordings. Conversations can be varied by gender and accent (e.g., Irish, North American, British, New Zealand, Australian, South African etc.) without re-recording, and because such data is text-based it is searchable, easy to annotate, and can be forkable (i.e., teachers can produce small variations on existing practices in seconds).

Furthermore, the system can analyze the results of thousands of interactions almost instantly, and where necessary teachers can drill down into the responses of individual students or sentences to understand where the students are struggling.

When using a computer for speech one must address the limitations: while speech synthesis continues to improve, it is still lacking in the tone, stress, and nuances of native speech, noting, of course, these are issues that can occur in pair-work.

Synthesis and recognition are not a replacement for speaking to a native, any more than a tennis ball machine can run and play like Rafael Nadal. Computers are simply unable to have natural open-ended conversations. However, in the same way that a machine can consistently lob balls to your dodgy backhand, a well-designed drill or role-play can enable a student to practice without fear of mistake. Particularly in the flipped classroom, giving students the opportunity to pre-practice conversations or patterns makes class time more efficient and gives students more confidence.

As mentioned above, the lack of a Web Speech API on iOS is a hindrance. At this point, it is not clear that Apple will ever allow such an API on iOS. It is possible that separate apps could be developed for use on iOS but this too is not ideal.

Speech recognition and synthesis is a rapidly evolving technology. We can expect further improvements especially with regards to intonation and natural speech meaning that this technology can be expected to have an even broader impact in the EFL classroom.

This article touched on drilling and role-play activities, but we are actively developing and other approaches such as (i) using gamification techniques: vocab quizzes and SRS, speed pronunciation tasks whereby a student must pronounce a word correctly before going on to the next one; (ii) Reading aloud: reading from news sources, books, etc. for accuracy; (iii) Mobile: dictating location-dependent commentary to describe environments etc.

A significant aspect of speech recognition is its ability to transcribe spoken words to machine-readable text. Even a single activity can generate thousands of student utterances. Using such techniques as corpora and tokenization, computer analysis of these sentences may be able common errors to be pinpointed, and overuse of particular vocabulary etc.

Further research also needs to be carried out to determine the effectiveness and best pedagogical approaches. Researchers and educators who are interested in using the system outlined in this article may contact the lead author.

Acknowledgement

References

Asimov, I. (1956). The last question. *Science Fiction Quarterly, 4*(5), 6–15
Berners-Lee, T. (1989). *Information management: A proposal.* **https://www.w3.org/ History/1989/proposal.html**

Calore, M. (2009). *W3C drops audio and video codec requirements from HTML 5*. Wired.com. https://www.wired.com/2009/06/browser_vendors_can_t_agree_on_media_codecs_for_the_web/

EU GDPR. (2018). The EU General Data Protection Regulation (GDPR) is the most important change in data privacy regulation in 20 years. https://eugdpr.org/

Github. (2019a). SpeechRecognitionResultList. https://wicg.github.io/speech-api/#speechreco-resultlist

Github. (2019b). SpeechRecognition Attributes. https://wicg.github.io/speech-api/#speechreco-attributes

Github. (2019c). SpeechRecognitionAlternative. https://wicg.github.io/speech-api/#speechreco-alternative

Grubb, J. (2018, May 8). Google Duplex: A.I. assistant calls local businesses to make appointments [video file]. https://youtu.be/D5VN56jQMWM

IBM. (2011a). Pioneering speech recognition: Overview. https://www.ibm.com/ibm/history/ibm100/us/en/icons/speechreco/

IBM. (2011b). Pioneering speech recognition: Technical breakthroughs. Retrieved from https://www.ibm.com/ibm/history/ibm100/us/en/icons/speechreco/breakthroughs/

Goldman, W. (1987). *The princess bride* [Movie script]. https://www.imsdb.com/scripts/Princess-Bride,-The.html

King, J. (2013). Silence in the second language classroom. Springer.

Kubrick, S. (Director, Writer), & Clarke, A. C. (Writer). (1968). *2001: A space odyssey*. [Film]. MGM.

Leviathan, Y. (2018, May 8). Google Duplex: An AI system for accomplishing real-world tasks over the phone [Blog post]. https://ai.googleblog.com/2018/05/duplex-ai-system-for-natural-conversation.html

Scott, R. (Director). (1982). *Bladerunner* [Film]. Warner Bros.

Turing, A. (1950). *Computing machinery and intelligence*. Mind, LIX (236): 433–460, https://doi.org/10.1093/mind/LIX.236.433

W3C. (2017). *W3C mission*. https://www.w3.org/Consortium/mission

Authors' Information:

Gary Ross is an associate professor in the Faculty of Pharmaceutical Sciences at Kanazawa University, where he is Director of English, and develops the online ESL program. He is also the webmaster for JALTCALL. His research focus is on usability, use of computer speech, and the integration of mobile into the classroom.
Email: gary@p.kanazawa-u.ac.jp

Stephen Henneberry is an associate professor at the University of Shimane and has been teaching at the tertiary level in Japan since 1998. His research interests include Cross-Cultural Communication, Computer Mediated Communication, and Extensive Reading.
Email: s-henneberry@u-shimane.ac.jp

Glen Norris is an associate professor of English at Ishikawa Prefectural University Liberal Arts Center and has worked extensively with Japanese students of all levels of proficiency for over 25 years. Current research project: managing workshops for graduate students preparing for international scientific oral and poster presentations.
Email: norrisgl@ishikawa-pu.ac.jp

14

Using the QWERTY Keyboard as a Chord Keyboard: Syllabic Typing by Multi-key Strokes for Language Learning & More

Markus Rude, University of Tsukuba

Abstract

The sequential QWERTY keyboard for computers is not the best for manual text entry: Skilled pianists strike twice as many keys per second compared to skilled typists. Stenographers do reach pianist-like input rates (up to 360 WPM) on chord keyboards by striking several keys simultaneously (chording). But for most users, neither dedicated chord keyboards, nor improved layouts for conventional keyboards are serious alternatives. In this exploratory paper, we ask: should we allow optional chording on QWERTY keyboards in addition to sequential typing? The claim is yes, since this could increase typing speed, reduce finger strain, and might in particular help language learners. Chording could be more natural, since it would be closer to human speaking, which is so fluent and quick due to the coarticulation of all articulators involved (up to 600 WPM). For language learners, high frequency syllables could be acquired through corresponding hand gestures, and thus, syllabic typing – chording in syllabic chunks (Figure 1) – would be even closer to the speaking process, which is also based on syllables. Arguments are taken from literature and from an experiment that shows an improvement of the typing rate for syllabic typing. Finally, two applications are suggested for language classes.

コンピュータのシーケンシャルQWERTYキーボードは、テキストの手入力に最適とはいえない。確かに、熟練したピアニストは、熟練したタイピストの2倍の速度でキーを叩き、速記者は、コードキーボードで複数のキーを同時に打つ（コードを押す）ことにより、ピアニストと同等の入力レート（最大360 WPM）に達する。しかし、ほとんどのユーザーは、専用のコードキーボードも、従来のキーボードのレイアウトの改善も、選択肢として真剣に考えたりしない。そこで、この論文では、次の問を立てる：QWERTYキーボードでシーケンシャルタイピングと共にコード入力を行うオプションを加えてはどうか？コード入力によりタイピング速度が上がり、指の緊張も軽減され、また、特に言語学習者の助けになると考えられるため、答えは「イエス」である。コードタイピングは、すべての調音器官の共同調音により最大600 WPMにもなるなめらかで迅速な人間の話し方に近いため、より自然であるといえる。また、言語学習者の場合、対応する手の形態を通じて高頻度の音節が取得できる。したがって、音節タイピング（音節チャンクでのコードタイピング）は、同じように音節に基づいた発話プロセスにより近くなる。これらの考察は、文献および音節タイピングによるタイピング率の改善を示す実験を論拠としている。なお、本論では最後に、言語クラス用に2つのアプリケーションを提案する。

Keywords: **typing, QWERTY keyboard, chording, mental syllabary, inter-key intervals (IKI)**

Figure 1
  QWERTY Keyboard

Note: There is only one word in German composed of the three characters "a", "s" and "d": the definite article for neuter nouns "das". Therefore, it would be sufficient to enter the chord "a-s-d" – to press three keys simultaneously – instead of typing the sequence "d"-"a"-"s". (The German keyboard is actually a QWERTZ keyboard – "z" and "y" are interchanged and four special German characters exist – but it is similar to the QWERTY keyboard).

A lot of time is wasted through bad practices. One example is formatting in text production: Though styles offer an efficient way of formatting paragraphs (e.g., for citations, first paragraphs, follow-up paragraphs in a section, etc.), many typists still use tabs and spaces for formatting, a habit from the era of mechanical typewriters. This habit causes not only a loss of time for the writers, but also for the editors, as Mason (2012) pointed out in his JALT CALL publication. Another legacy from mechanical typewriting is serial typing. The design of mechanical keyboards requires strict serial, non-overlapping typing. Before a key is pressed, the previous key must be released to avoid jamming. The designers of the QWERTY keyboard intended to minimize the risk of jamming by assigning characters of adjacent typebars such that corresponding character pairs (e.g., q&a, a&2, 2&z, z&w, w&s, etc.) are unlikely to appear in sequence. Although this risk disappeared together with mechanical typewriters completely, computer typists are still required to strike letter strings in a serial order, even if partial overlap of key activations is now tolerable.

However, there are good reasons for giving up the limitation of sequentiality and for accepting also parallel input: Some stem from a comparison with speaking with its coarticulated overlapping sounds; others from timing analyses in typing, which show systematic "pauses" between syllables among general typists and a widespread trend to overlap of keypresses (rollover) among fast typists. And finally, all typos resulting from key inversions could be considered valid input (and automatically corrected), if bigrams could optionally be entered by a double-keystroke (or trigrams by triple-key-strokes). In particular, language learners could benefit from such a simultaneous key entry mode, if they typed text in syllabic chunks: It could help them to acquire the speech rhythm of the foreign language, which often is also syllable-based; or it could help them to acquire high frequency syllables and words with the additional resource of muscle memory – one specific hand gesture for one specific syllable. And even without automatic correction, scrambled text can be useful for certain language learning purposes, as will finally be described.

To sum up, the layout of computer keyboards is a legacy from old-fashioned mechanical typewriters, just like the outdated usage of tabs and spaces for formatting that still can be found. A third legacy from typewriters is an operational, now superfluous restriction: Typing must be character-sequential, which is less efficient compared to chorded typing, as stenographers or pianists demonstrate. Our research asks whether the QWERTY keyboard could also be used for simultaneous typing (chording), additionally & optionally to the usual typing mode (sequential typing), and whether this could offer more speed, cause less strain, and – if chording were done in syllabic chunks – support foreign language learners.

Method

Here, the hypotheses of the paper are stated, as well as an outline of the method of argumentation, which complements cognitive research findings with results from a small experiment. The study is exploratory in nature; more experiments will follow.

There are two hypotheses related to the suggested optional introduction of simultaneous typing on the QWERTY keyboard:

- H1: The combination of sequential typing and simultaneous typing (chording) is more natural than conventional sequential typing only; thus it can be quicker and could be less prone to cause fatigue.
- H2: The sub-form of chording in syllabic chunks (syllabic typing) combined with sequential typing is more similar to spoken language than conventional typing; thus it can help language learners to acquire high-frequency syllables and to develop a sense for the rhythm of target languages like German or English.

Outline of the Method

As a main argument, the author will report and relate findings from cognitive research in the productive skills of speaking, typing and writing, and from research on chorded text input. The arguments from theory and empirical research are complemented by a first experiment, chording and typing the German definite articles "der die das".

Arguments for Simultaneous Typing (H1): Chording on Pianos and Chord Keyboards

In this section, it will be shown, by comparison with other input devices, that the sequentiality restriction on the QWERTY keyboard is limiting and unnecessary.

Pianos

As stated above, pianists achieve very high key input rates, which was the reason for a research group in Germany turning a piano keyboard into a computer keyboard for text entry by assigning each of the 26 characters of the alphabet one or several of the 88 piano keys (Feit & Oulasvirta, 2014). One participant, a professional piano player, played musical sheets with encoded texts prepared by the research group. He reached – with some practice sheets and then with two previously unseen sheets – 71 WPM and 79 WPM. He stated that playing this "music" was basically easy due to its similarity to atonal music, but trying to play it as quickly as possible instead of following an overall rhythm was unusual and required some training. Another participant, a hobby pianist, practiced for 25 weeks (6 h per week), e.g. for learning the character-to-key mapping: this participant could then also copy normally written text with the piano keyboard. She could even reach 81 WPM with an error rate of 4% at the end. The relatively high rates (typists usually type with 50 to 75 WPM) were reached (1) by optimized character-to-(piano-)key correspondences, frequent bigram sequences being mapped to frequent transitions on the piano, (2) by exploiting the redundancy, e.g. the most frequent letter "e" of the English alphabet being realized on every octave, (3) by mapping the most frequent words of the English language to the most frequent chords on the piano, and others. In the same paper, Feit & Oulasvirta also reported on the high keying rates of elite pianists, e.g. 17 notes per second for a certain piece ("Flight of the Bumblebee"), which would correspond to 204 WPM, and which could even reach 30 notes per second (p. 1045), corresponding to 360 WPM.

Chord Keyboards

Text entry by chording through dedicated chord keyboards has been explored since the end of the 19th century, through the 20th century, until now; one important user group are stenographers, e.g. court reporters who use systems like stenotype. In her PhD thesis, Martin (1981) analyzed alphanumeric entry methods by different keyboards, e.g. the QWERTY sequential keyboard and chorded keyboards, and concluded that QWERTY was not optimal and needed modification; however, "[t]he QWERTY keyboard will continue to monopolise the sales of alphanumeric sequential keyboards." (Martin, 1981, p. 274). She has been right, at least until today (see also the main findings of the thesis in Noyes (1983) by the same author under her new name). Chord keyboards have only been used by a minority and this is unlikely to change.

Since about 10 years ago, there has been a low-cost solution for the otherwise quite expensive professional hard- and software to do machine stenography with chord keyboards. Plover is the name of an open source project that offers downloadable kits for anyone who likes to learn and use chording for text entry or programming. Usually, dedicated chord keyboards have fewer keys than ordinary keyboards, but if a QWERTY keyboard is capable of n-key rollover (accepting input from multiple keys being pressed simultaneously), it might be turned into a chord keyboard and use Plover. Interestingly, the Steno World Record of 360 WPM (according to Plover, 2019) for machine stenography coincides with the maximum piano keying rate when playing music (see above). For stenography, however, this high rate has not been reached only through chording. Other factors are the use of shortcuts, the minimization of distances the fingers have to move due to the smaller number of keys, and year-long practice.

As stated above, chord keyboards reach the highest manual input entry rate for text (up to 360 WPM), which is faster than people usually speak (150–200 WPM), but still slower than the world's fastest speaker (about 600 WPM).

Such high rates for speaking are only attained through coarticulation of all speech organs involved, through the production of syllables as holistic units or chunks. In languages with shallow orthography like Spanish, and – to a lesser degree – also German, people sometimes claim to write like they speak, each character having an associated sound and vice versa, or – in linguistic terms – each grapheme being associated with a phoneme which is realized as a phone. Such claims and ordinary orthography are somehow misleading: Usual writing is sequential and non-overlapping (Figure 2, left, "sehr schön" = "very beautiful") and lets us implicitly assume that the corresponding phonemes are realized in the same sequential and non-overlapping way.

Figure 2

Standard Orthography and Type are Phonological

Note: The serial, non-overlapping order of characters (left) lets us assume also a serial, non-overlapping chain of abstract phonemes and their realizations as a sequence of distinct sounds. In this sense, calligraphy, showing a connectedness among most letters (right), is already closer to phonetic reality.

However, the vowel phonemes /e/ and /ö/ are phonological abstractions; their features – most notably lip spreading for "e" and lip rounding for "ö" – extend from start to end of the corresponding words. Connected and outreaching characters as in calligraphy (Figure 2, right, "Zapfino") already suggest such aspects of coarticulation to some extent. We could even write these words as in figure 3, if we like to express phonetic reality: Here, vowel sounds reach out over the whole mono-syllabic word, from onset to offset of their syllables. In the phonetic, articulatory domain, syllables are the smallest

serial units of real speech, not phonemes, since coarticulation merges sounds together into undividable entities.

Figure 3

A More Realistic, Phonetic Orthography?

Note: Here, vowel letters extend to syllable borders, visualizing that certain sound features (e.g. roundedness of lips for "ö") are associated with the whole syllable, and that a concrete utterance is a sequence of undividable syllables.

Summary

Current typing on QWERTY keyboards with its sequentiality restriction mimics the phonological sequences of phonemes, which is but a phonological abstraction. This restriction results in a cognitive and motoric burden for typists and is in stark contrast to phonetic reality for speakers: In typing, a typist's fingers must obey a sequentiality and distinctness in reaching motion targets which are alien to a speaker's speech organs in speaking; if a similar sequentiality and distinctness were requested from the latter, human speech would sound like early robots and never reach the fluency humans have. Text input on chord keyboards (reaching 360 WPM) and human speaking (reaching 600 WPM) demonstrate that higher language production rates are possible compared to current typing (reaching 200 WPM). A certain acceleration of typing speed and other advantages could thus be expected from QWERTY keyboards as well, if chunking through parallel key activations or similar forms of coarticulation of actuators were allowed.

Arguments for Syllabic Typing (H2): The Important Role of Syllables

In this section, it will be argued that syllables are natural chunks of language production – in speaking and writing – and could also be used in typing on a QWERTY keyboard.

A Mental Store for Syllables, and their Roles in Writing & Typing

Already at the end of the last millennium, it was postulated that humans have access not only to a mental lexicon of words, but also to a mental storage of syllables (phonological forms) for speech production (Levelt & Wheeldon, 1994). Schiller et al. (1996) support this view with the argument that 500 syllable types in English would suffice to cover 80% of syllable tokens in a given corpus, which would even turn a rather modest syllabic memory into an efficient element in speech production. This hypothetical storage for high frequency syllables is called mental syllabary. In addition to composing words from individual phonemes, this model assumes frequent syllables to be retrieved as units from the mental syllabary in order to be assembled to words or phrases. Meanwhile, it has been shown that the syllable also plays an essential role in typing and handwriting, subconsciously but detectable through timing analyses. The main argument stems from IKI (inter-key interval) analysis for typing, and MSD (mean stroke duration) analyses for handwriting. The IKI is the time interval between

pressing two consecutive keys on a keyboard, the MSD is a timing measure for handwriting and expresses for every letter the average time needed to write one of its strokes (see also appendix for the exact definition). It has been shown that IKIs between syllables are longer than within syllables, and that MSDs of syllable-initial letters are longer than those of other letters. Both findings consistently indicate that syllables likely play an important role in motion planning and execution in typing and in writing. Some researchers assume that this "pausing" is needed to finalize motion execution commands in syllabic portions.

Figure 4 shows the IKIs (in ms) for typing the trisyllabic German word "Schnee|land|schaft" (winter landscape) in an experiment (Nottbusch et al., 1998). The horizontal axis shows all 16 characters, and for each character (except the first) in the vertical dimension the IKI, which is here the time interval between the current and the previous key activation (therefore no value for the first upper case character "S", since only individual words were typed in the experiment). Two of the four local maxima of the IKIs can be observed at the onset of syllables (letters "l" and lower case "s"): More than 400 ms between the last key of "Schnee" (snow) and first key of "landschaft" (landscape), double or more than double the IKIs at the local minima (letters "h", "e", "n", "h"). Here (at "l"), syllabic and morphemic boundaries coincide, a fact which generally produces the longest IKIs. If the boundaries do not coincide, the IKI at the syllabic boundary is usually longer than the IKI at the morphemic boundary.

Similar results – longer IKIs before the onset of syllables equal small "pauses" between syllables – have been replicated for several languages, e.g., for Finnish (Bertram et al., 2015) or French (Pinet et al., 2016). And corresponding results for the role of syllables in handwriting have also been shown by Hess et al. (2016), namely a systematic slowdown of the handwriting process during the first letter of syllables (increased MSDs, mean stroke durations) among children as well as adults.

This is surprising, since in fluent handwriting, there is no visual border between individual syllables belonging to the same word. (The timing analyses are possible through handwriting on a computer tablet and sampling the pen tip's position.)

Figure 4
Syllables Influence also Sequential Typing
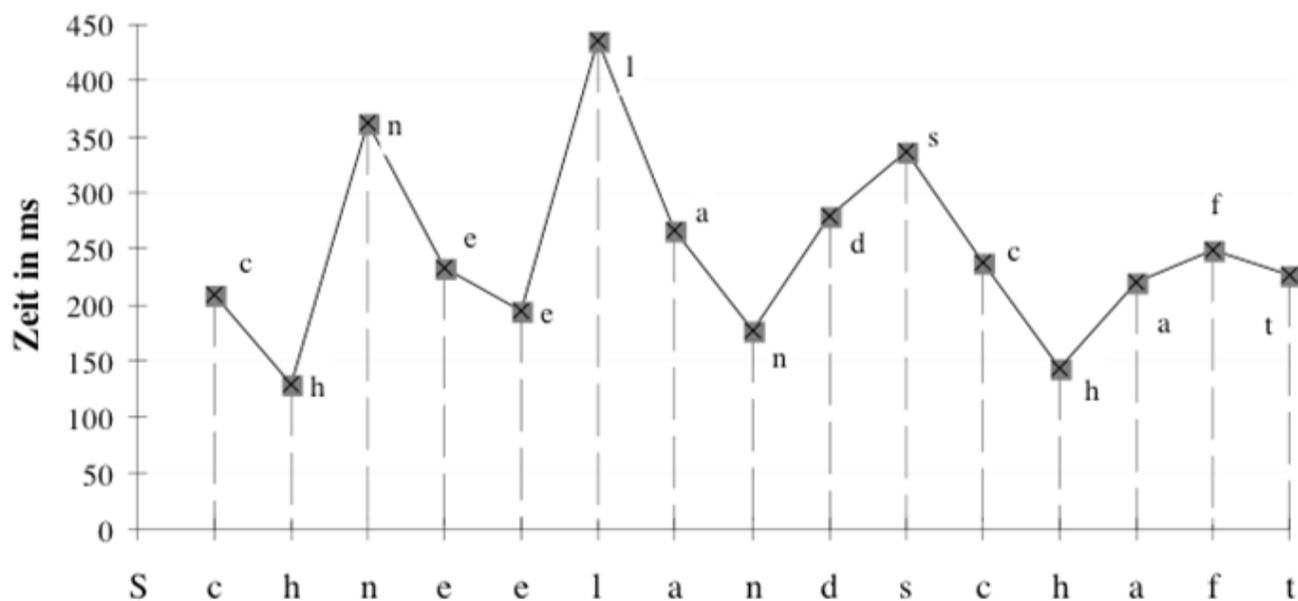
Note: The typed German word "Schneelandschaft" (winter landscape) shows longer inter-key intervals (IKI) mainly at the onset of syllables, little "pauses" between syllables: Schnee-Land-Schaft. (Figure 4 from Nottbusch et al., 1998, reproduced with the permission of the first author).

In accordance with this and similar results, some researchers suggest a mental syllabary – a mental store of motion programs for high frequency syllables – also for writing and typing, in addition

to the already mentioned mental syllabary for speaking that Levelt and Wheeldon postulated. Other researchers put forward the so-called parallel activation hypothesis, which assumes that "words cause the parallel activation of constituent keystrokes" (Crump & Logan, 2010, p. 1379). And typing analyses show that rollovers – partial overlap of key presses, in particular within syllables – are used by fast typists today in 40% to 70% of all keystrokes, as reported in Dhakal et al., (2018, pg. 8).

Summary

Since the strict sequential order of phonemes is but an abstraction (see Figure 3), and since acoustic reality shows a high degree of co-articulation in speaking, why should typists be forced to type strictly sequentially? As described above, the quickest typists are pianists and stenographers, exercising a blend of serial and parallel input. And as rollover of fast typists, but also inversion errors of general typists show: there is a tendency towards parallel typing despite it still being prohibited. All these pieces of evidence point to our claim: a combination of sequential and simultaneous typing is more natural and likely more efficient than sequential typing only.

A Simple Experiment

This section describes a simple experiment in which one string consisting of three monosyllabic words was repetitively typed or chorded.

Procedure

In the experiment, the most frequent German word – the definite article (Jones & Tschirner, 2015) – was typed repetitively. Each trial consisted of simultaneously typing the string "der die das" (in three chords) for 1 minute, followed – after a short break – by 1 minute of sequentially typing the same string. Half the trials started in one, half the trials in the other mode. For simultaneous typing, the string was thus realized by six (single- or three-key) strokes: three chords of three letters each, plus three spaces. As for sequential typing, the string was typed by 12 single-finger strokes: 3 × 3 characters plus three spaces.

Participant. The author. He has had about 40 years of practice of sequential typing (touch typing), and about 2 years of practice of simultaneous typing.

The results. Figure 5 shows the result of 10 days × 6 trials. In all trials except one, WPM for simultaneous typing was higher than for sequential typing (WPM1 > WPM2). After about four days (24 trials), WPM1 was always higher than 100 WPM. The absolute values of WPM were calculated as the number of characters typed in one minute divided by five (WPM = CPM/5), and then multiplied by the ratio (# of correctly written strings / # of all written strings) in order to account for the errors. (Note: Even if only one symbol among the 12 was mistyped, the whole string of 12 symbols was judged erroneous).

Interpretation

A comparison of the WPM rates shows a clear advantage of simultaneous typing. However, the result must not be generalized, since only one string containing only three distinct, monosyllabic words was typed. Learning just three chords of the same length gives some advantage to the simultaneous mode. Yet, even if the general gain will be lower – and this will most certainly be the case – the simple experiment showed the basic advantage of chording compared to sequential typing.

Figure 5
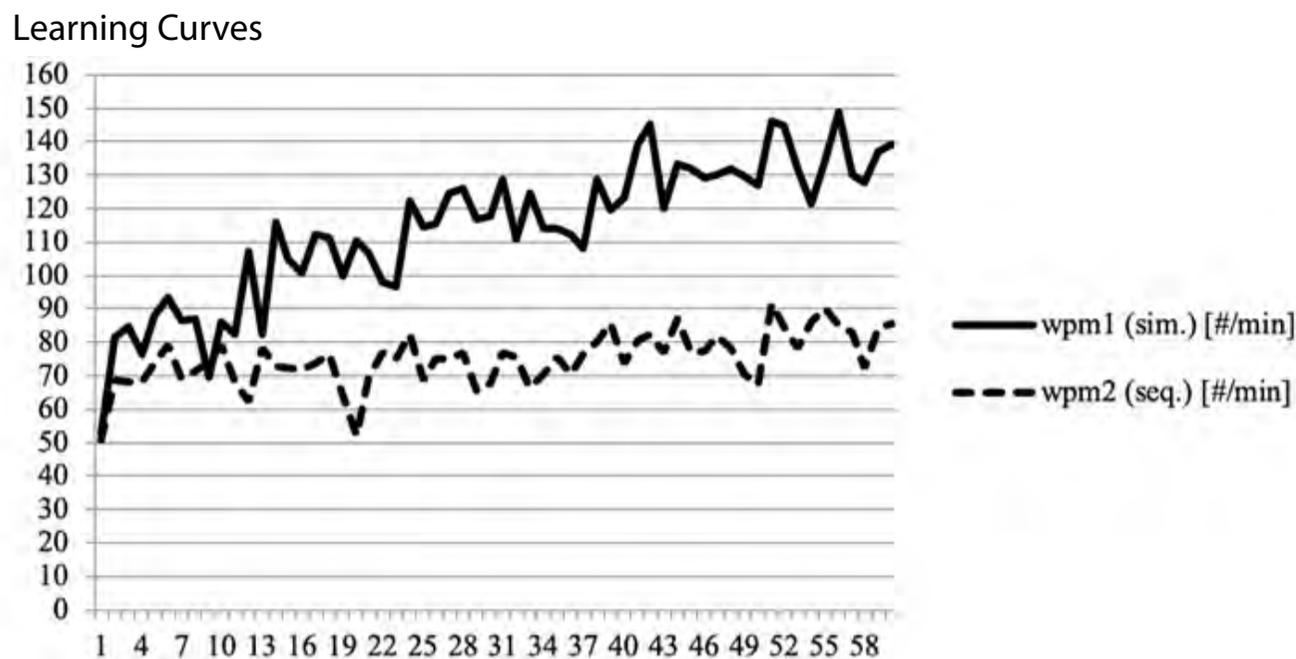
Learning Curves

Note: Learning curves for simultaneous (WPM1) and sequential typing (WPM2) when typing the German articles "der die das" repetitively. WPM1 reached up to almost 150 WPM within the 10-day learning period, WPM2 was always below 100 WPM.

Summary

The main arguments for H1 (naturalness of chording) are facts from pianists and stenographers, who reach higher keying rates and WPM rates compared to typists. The main argument for H2 (similarity of chording in syllabic chunks with speaking) is the common basis of the syllable for both modalities: Speech is produced by a series of distinct syllables rather than by distinct sounds, and it can reach the highest speed among the oral and two written productive modalities: Distinct sounds, i.e., phones, do not exist; only their abstractions, phonemes, exist as distinct entities. The phonetic features of the phones can spread at least up to the syllable borders (e.g. lip rounding). Starting from Levelt and Wheeldon's suggested mental syllabary for speaking, research has shown that the syllable also plays an organizing and structuring role in typing and handwriting. Evidence stems from IKI analyses for typing, and MSD analyses for handwriting. It has been shown for several languages that there are larger IKIs at syllable borders (pausing) or MSDs in syllable-initial letters (slowdowns) in the two modalities, proving that chunking into syllabic units occurs even when typing, though unintended and unnoticed.

Discussion

Though just at the beginning, this research promises to contribute to the domain of language acquisition the technique of syllabic typing; this technique has the potential to help a typist with the acquisition of a mental syllabary, i.e. a mental storage of motion patterns for the most frequent syllables in a target language to be realized as chords. For practical and theoretical reasons, the envisaged mode of typing is not purely syllabic typing, but a hybrid form of sequential and syllabic typing: There are far more than 10,000 different syllables in the German language, which are clearly impossible to learn as distinct gestures, one hand gesture for each chord (syllabary-size problem). Additionally, some syllables consist of up to ten characters, which is too complex for one multi-finger stroke (syllable-length problem). And finally, some syllables contain a character twice, which – on a QWERTY keyboard – requires two serial activations (double-character problem). Therefore, syllabic typing is only a paradigm or idealization, not an achievable goal. Within reach is, however, a hybrid form, an

optimum balance between sequential and syllabic typing, e.g., the acquisition of the most frequent, simple syllable gestures as chords and the realization of others either sequentially, or as sequences of constituent unigrams, bigrams and trigrams.

One suggested hybrid form is as follows: sequential typing of stressed syllables and syllabic typing of unstressed syllables. We will call this form "prosodic typing" for reasons that will become clear below. For this hybrid form, we state two further hypotheses related to language learning:

- H3: Prosodic typing, i.e. the hybrid form of typing stressed syllables sequentially and unstressed syllables simultaneously, can help – if actively pursued as a process – to acquire the rhythm of a language like English or German.
- H4: Uncorrected prosodic typing – here understood as the product – can serve as puzzles or review exercises for language learners and even support the development of listening comprehension: Unstressed syllables, when chorded, will turn out to be scrambled and need to be guessed, need to be reconstructed, just in the same way as reduced or omitted unstressed syllables in spoken language need to be guessed, need to be reconstructed.

Argument for Prosodic Typing (H3): The Process

Mimicking Alternations of Syllable Speaking Duration through Alternations of Typing Speed

Chording every syllable would create a homogeneous syllabic rhythm in typing, comparable to the French syllable-timed speech rhythm (syllables are considered to have about equal duration in such languages). In contrast, stress-timed languages like English and German show large variations in syllable duration, stressed ones being generally longer than unstressed or reduced ones. This characteristic can be imitated by prosodic typing, since it mimics the temporal relation between stressed syllables and unstressed syllables. If syllables are stressed, they become longer when spoken, since they will be more carefully articulated, and they become longer when typed, since they will be typed sequentially, one character after the other. If syllables are unstressed, they become shorter when spoken, since they are less carefully articulated, reduced or even omitted, and they become quicker when typed, since they will be typed as uni-, bi- or trigrams, or even completely in parallel, as one chord.

Correction software can yield a text as in Figure 6, showing the first strophe of a German traditional children's song. It has been typed as described, partially simultaneously (chorded), partially sequentially (typed). Caps show stressed syllables (typed), small caps show unstressed syllables (chorded); a prototypical correction software (text replacement of Microsoft Word) unscrambled the inverted and permutated letters of the unstressed ones.

Figure 6

First Strophe of a Traditional German Children's Song

GERMAN TRADITIONAL SONG IN „PROSODIC TYPING"
GRÜN grün GRÜN sind ALle meine KLEIder,
GRÜN grün GRÜN ist ALles was ich HAB'.
DArum LIEB' ich ALles was GRÜN ist,
WEIL mein SCHATZ ein JÄger IST.

ENGLISH LITERAL TRANSLATION
Green green green are all my clothes,
Green green green is all that I have.
Therefore love I all that green is,
Because my treasure/darling a hunter is.

Note: 1st strophe of a traditional German children's song, stressed syllables typed sequentially (caps),

unstressed syllables as chords (small caps). This text, made by prosodic typing, could help students to remember the rhythm of an L2, since it shows the four stresses (beats) of each line in prominent caps.

It should be noted that through the text replacement procedure, the distinction between stressed/caps and unstressed/small-caps was simply done based on the typing product criterion sequential/scrambled. Occasionally, words had to be rewritten, if they were typed simultaneously, but accidentally appeared in the right sequence (yielding caps instead of small caps). Thus, the criterion in this prototype needs to be revised.

Argument for Uncorrected Prosodic Typing (H4): The Product

Mimicking Fluctuations in Intelligibility in Speaking through Fluctuations in Legibility

Uncorrected prosodic typing would mimic the fluctuation of intelligibility of spoken language through a parallel fluctuation of legibility. The corresponding fluctuation in the two domains can be described as alternation of stressed syllables (clearer when spoken / when typed) and unstressed syllables (more opaque when spoken / scrambled when typed). Listening comprehension could be facilitated through supplying texts which are partially scrambled like in Figure 7.

Figure 7
Uncorrected Lyrics from Figure 6

SONG REVIEW: REMEMBER WORDS AND MEANING?
GRÜN RGNÜ GRÜN SIDN ALEL IMEEN KLEIDRE,
GRÜN GRNÜ GRÜN STI ALESL WSA CIH HAB'.
DAMRU LIEB' CIH ALESL WSA GRÜN STI,
WEIL EMIN SCHATZ INE JÄRGE IST.

Note: Lyrics from Figure 6, here uncorrected. Unstressed syllables are scrambled as a result of chording during prosodic typing. Similar texts have served as review and recall exercises for students after having learned some songs.

There has been some research on intelligibility in the acoustic domain, e.g. on the influence of noise on L1 and L2 comprehension, or on the influence of inversions (reversions of speech signal sections of less than 100 ms seem to hamper comprehension only moderately); there has also been corresponding research in the domain of reading, e.g. on the influence of inversions or permutations of characters on legibility (in certain contexts, quick readers are not even aware of certain character inversions). The similarity of results in those two different domains suggests to relate them also in L2 acquisition.

Limitations

The limitations of syllabic typing and this study:
- Homophones: Many character sets can constitute more than one word (e.g. "d/i/e" can also yield "Eid" (Oath)).
- Participants in the experiment: The author (subject in the experiment) has had about 2 years of practice of simultaneous typing. He is also a touch typist, and he had organ lessons for several years when he was younger. Learning curves for novices might be slower and lower (Figure 5).
- Most important: The author is not an independent subject in the experiment, he might be biased. In particular, the comparison of simultaneous and sequential typing showing a considerable

gain of simultaneous typing needs replication with other participants in order to become a reliable result.

Conclusion

Though more than 100 years old, the QWERTY keyboard will most likely also be the most common computer keyboard for some time to come. This paper suggests to extend its usage – to use it as a combination of sequential and chord keyboard, as a hybrid chord keyboard. Users could slowly develop their ability to use both text entry modes, typing and chording, replacing frequent key sequences gradually, but reversibly through chords.

What a user needs is an N-key rollover keyboard (capable of multi-key input) and auto-correction software (simple prototypes can be made by text replacement functions). Typing one 12-symbol string repetitively in a simple 10-day experiment showed an increasing WPM rate that reached almost 150 WPM. Thus, the method could help users to become faster typists.

More important than speed: there are useful applications for language acquisition. Chords on the computer keyboard could be learned that correspond to the most frequent syllables of a target language and thus support the acquisition of a mental syllabary, from and for typing, similar to the mental syllabary for speaking. Chords of two, three, or even four keys can be learned and memorized, four-key chords even better by two hands than by one hand alone (Bos, 2019). Memorizing syllables through hand postures could utilize human muscle memory as an additional resource for learning an L2. The products of uncorrected simultaneous typing, texts with partially scrambled syllables, have already been used in class for review and recall exercises.

In summary, two ideas have been brought up in this paper. First, to use QWERTY keyboards also for simultaneous typing, for chording. Though existing chord keyboards usually have fewer keys than a QWERTY keyboard – which actually has not been designed for chording – this research acknowledges the fact that the general user is not willing to change to a different keyboard design or to learn a new key-character mapping. Therefore: If chording shall be made available for the general user, this must happen on a QWERTY keyboard. Second, to suggest chording as optional entry mode, in addition to the current, sequential input mode on QWERTY keyboards. Freedom of choice at any instant during text entry is required since some users will only change their sequential typing habits very slowly, some not at all; but optionality would allow all users to incorporate multikey-strokes in their typing routines and to develop their individual skill of mixed typing and chording at their pace; inversion and permutation errors would vanish completely since they would turn into valid input; insertion and omission errors could decrease if the speed advantage through chording were invested in slowing down typing, which in turn could become more precise in space (fewer unintended double-key presses → fewer insertion errors) and time (fewer non-activations from superficial presses → fewer omission errors). With intelligent correction software, this development could even happen automatically, unintended and unnoticed. Typing might then become more similar to speaking, possibly quicker, more accurate or less tiring, and it could possibly express our thoughts or utterances in a smoother way, in its natural rhythm. Planning processes for speaking and writing seem to be more alike than previously thought (Roeser, 2019), and even when just listening to lists of disyllabic words, our brain shows regular neural activation in a syllabic rhythm (Rimmele, 2019).

References

Bertram, R., Tønnessen, F. E., Strömqvist, S., Hyönä, J., & Niemi, P. (2015). Cascaded processing in written compound word production. *Frontiers in Human Neuroscience*, *9*, Article 207. **https://doi.org/10.3389/fnhum.2015.00207**

Bos, M. A. (2019). *Investigating a motor skill: The case of chording* (Bachelor's thesis, University of Twente).

Crump, M. J., & Logan, G. D. (2010). Hierarchical control and skilled typing: Evidence for word-level control over the execution of individual keystrokes. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *36*(6), 1369–1380.

Dhakal, V., Feit, A. M., Kristensson, P. O., & Oulasvirta, A. (2018, April). Observations on typing from 136 million keystrokes. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems,* Paper 646, 1–12, ACM.

Feit, A. M., & Oulasvirta, A. (2014, June). PianoText: Redesigning the piano keyboard for text entry. In *Proceedings of the 2014 conference on Designing interactive systems*, 1045–1054, ACM.

Hess, S., Mousikou, P., Verrel, J., & Schroeder, S. (2019). Syllabic processing in handwritten word production in German children and adults. *Human Movement Science*, *65*, 5–14.

Jones, R., & Tschirner, E. (2015). *A frequency dictionary of German: Core vocabulary for learners*. Routledge.

Levelt, W. J., & Wheeldon, L. (1994). Do speakers have access to a mental syllabary? *Cognition, 50*(1-3), 239–269.

Martin, J. M. (1981). *A study of keying skills and various alphanumeric keyboards* (Doctoral dissertation).

Mason, P. (2012). Style counsel: Exorcising the typewriter from the computer-enabled classroom. **https://journal.jaltcall.org/storage/articles/JALTCALL%208-1-45.pdf**

Nottbusch, G., Weingarten, R., & Will, U. (1998). Schreiben mit der Hand und Schreiben mit dem Computer [Writing by hand and writing with the computer]. *Osnabruecker Beitraege zur Sprachtheorie (OBST), 56,* 11–27.

Noyes, J. (1983). Chord keyboards. *Applied Ergonomics*, *14*(1), 55–59.

Pinet, S., Ziegler, J. C., & Alario, F. X. (2016). Typing is writing: Linguistic properties modulate typing execution. *Psychonomic Bulletin & Review*, *23*(6), 1898–1906.

Plover. (2018). Openstenoproject Plover. *Stenography Overview*. Retrieved from **https://github.com/openstenoproject/plover/wiki/Stenography-overview**

Rimmele, J. M., Sun, Y., Michalareas, G., Ghitza, O., & Poeppel, D. (2019). Dynamics of functional networks for syllable and word-level processing. *bioRxiv*, 584375.

Roeser, J., Torrance, M., & Baguley, T. (2019). Advance planning in written and spoken sentence production. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. **https://doi.org/10.1037/xlm0000685**

Schiller, N. O., Meyer, A. S., Baayen, R. H., & Levelt, W. J. (1996). A comparison of lexeme and speech syllables in Dutch. *Journal of Quantitative Linguistics*, *3*(1), 8–28.

Appendix

Key Terms

IKI: Inter-key Interval: the time interval between two successive key activations.

MSD: Mean Stroke Duration. Timing measure for handwriting that expresses for each letter the average time needed for writing one of its strokes; it is defined as "the ratio of total writing duration for a single letter to the number of strokes needed per letter" (Hess et al., 2019).

WPM: Words Per Minute. Measure of typing speed. Since the average number of characters per word differs considerably between different languages and between different texts, WPM is usually defined & calculated by the division of the number of all keystrokes (including shift, space, etc.) by 5.

Rollover: Typing a key with rollover means that the key is pressed before the previous key is released.

Rollover ratio: A measure for the strength of the tendency of a typist to use rollover during typing. This measure has been proposed in Dhakal (2018), where it is defined as "the number of keystrokes typed with rollover (where the previous key is still held down at the time of the keypress) divided by the total number of keystrokes."

Author's Information:

Markus Rude is an associate professor for German as a Foreign Language. His main research interest has been the visualization of prosody through "Prosodic Writing," a curved writing style expressing intonation and stress for language learners. It includes now also typing and chording, again with foreign language acquisition in mind.
Email: **rude.markus.fn@u.tsukuba.ac.jp**

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