

## 科学研究費助成事業 研究成果報告書

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研究課題名(和文) Investigating the Complexity, Accuracy, and Fluency (CAF) Writing Development of First Year Students Over a School Year

研究課題名(英文) Investigating the Complexity, Accuracy, and Fluency (CAF) Writing Development of First Year Students Over a School Year

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交付決定額(研究期間全体)：(直接経費) 3,100,000円

研究成果の概要(和文)：学生は、文法的な正確さを反映した学術論文を作成する必要に迫られています。そこで、最初の成果である「オンライン文法チェッカーVersus Self-Editing：というテーマで、オンライン文法チェッカー(grammarly.com)の有効性と自己校正の有効性を比較検討しました。日本の九州の4つの大学が参加し、199本の論文が集まりました。99本のエッセイをオンライン文法チェッカーで校正しました。この研究では、2つの校正方法の間にわずかな違いが見られたが、結果は、オンラインツールが特定の文法的な誤りを特定するのに役立つことを示しています。

研究成果の学術的意義や社会的意義

The study showed that grammatical online checkers were more effective and that writing classes did not improve (overall) the complexity, accuracy, and fluency of most EFL students. It was apparent that students needed far more guidance in these three areas.

研究成果の概要(英文)：Students are under more pressure to produce academic papers that reflect a high level of grammatical accuracy. So, concerning the first achievement, I examined the effectiveness of one online grammar checker (grammarly.com), and compared it to the effectiveness of self-editing. Four universities in Kyushu, Japan were involved, with 199 papers. Ninety-nine essays were proofed by an online grammar checker. The study showed marginal differences between the two methods of proofing, but results indicate that online tools can be useful to identify certain grammatical errors. My second achievement was presented in Zurich, Switzerland, and is now under review with the journal "Assessing Writing." Results showed there was a significant difference between the groups; likewise, fluency did not significantly increase over time, whereas some syntactical complexity variables did show significant increases. The final three research questions, results showed significant differences.

研究分野：Linguistics

キーワード：Complexity Accuracy Fluency Writing Syntax Editing Proofing Online grammar checkers

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## 1. 研究開始当初の背景

and evaluation is done in regard to grammatical accuracy and TOEIC scores, little information is known about Japanese students' actual skills in L2 composition, and how they improve over a school year. The significance of this research will show the actual impact and improvement in the L2 writing of Japanese in ordinary universities throughout Japan. As the study also incorporates teacher interviews concerning issues regarding curricula, teaching methodology, and resources, the students' results will be better understood concerning what has actually been done, and how teaching was carried out. By understanding the strengths and weaknesses of each program, recommendations can be made as to how to improve all of the complexity, accuracy, and fluency (CAF) constructs.

## 2. 研究の目的

The aim of this study is to examine how Japanese students' writing improves over the school year and to see how effective online grammar checkers are in improving grammatical accuracy. Specifically, the study seeks to examine grammatical accuracy, fluency (how many words students can write in 30 minutes), complexity (vocabulary and syntactical).

## 3. 研究の方法

This research will year-by-year will examine six compositions of 120 students, written over a school year, at three institutions in each region. Three regions will be examined: Kyushu, Yamaguchi / Hiroshima, and Kanto. Three interviews will be conducted with teachers at each institution to gather data concerning resources, time spent on writing, and curriculum. Three papers will be collected over the school year, as shown below. Two groups will be formed: the control group will self-edit their papers for 10 minutes while the treatment group uses a free online grammar checker (grammarly.com). This group will send a copy of the unedited paper and the final edited paper to the researcher.

### **FY2019 Investigation of three institutions in Kyushu**

Permission will be obtained in order to gather data at three to four institutions in Kyushu and to solicit the cooperation of approximately 120 students. Students will be asked to write a total of three papers, one every four months, concerning various topics. The first set of papers will be compared among the three institutions to describe common features and distinct differences. These differences will then be discussed in light of any information provided from the teachers' interviews. The first, second, and third papers will then be compared within each institution to see how complexity, accuracy, and fluency changed.

### **FY2020 Investigation of three institutions in Western Japan and Kansai**

Permission will be obtained in order to gather data at three to four institutions in western Japan and in Kansai region to solicit the cooperation of approximately 120 students. Students will be asked to write a total of three papers, one every four months, concerning various topics. The first set of papers will be compared among the three institutions to describe common features and distinct differences. These differences will then be discussed in light of any information provided from the teachers' interviews. The first, second, and third papers will then be compared within each institution to see how complexity, accuracy, and fluency

changed.

A serious educational problem in Japan concerns the teaching and quality of L1 (Japanese) and L2 (English) writing as well as with editing/proofing. This study will focus on six compositions from 120 students over the course of one academic year: the purpose to examine how complexity, accuracy and fluency (CAF) (time that is taken to write the number of words) improve, if at all. Students' writing will be examined at three proficiency levels (designated by TOEIC scores), and, to have some level of generalizability, eight universities will be selected in Kyushu and Honshu.

The first construct of complexity involves syntactic *complexity*. For measuring the complexity of the L2 writing, Ortega (2003) mentions five indexes: Sentence complexity, coordination, subordination, length of production, and particular structures. In 2009, Norris and Ortega proposed three indexes. These indexes are based on L2 learners' level of proficiency. For example, coordination is an appropriate measure for the beginning levels, subordination for the upper-intermediate levels, and sub-causal for the advanced levels. Lexical complexity is made up of length, morphology, familiarity, etymology, ambiguity, and context.

The second construct of *accuracy* in SLA relates to the proportion of the error-free units are very much important (Lambert & Kormos, 2014). On the contrary, researchers (e.g., Palloti, 2009) believe that this kind of accuracy measurement has validity problems since it ignores the complexity existing in a piece of discourse.

The construct *fluency* is the third index of CAF through which one can track L2 development in general, and L2 writing, in particular. Fluency in writing is the extent to which a piece of writing is native-like (Polio, 2001). In another definition proposed by Tarone, Downing, Cohen, Gillette, Murie, Dailey (1993, p. 170) the issues of "nativeness, standardness, length, ease of reading, idomaticity" are highlighted.

**Key scientific question**" comprising the core of the research plan

Two questions are being investigated. First, how does students' writing (lexical and syntactical complexity, grammatical accuracy, and fluency) improve over a school year? How can the gains of beginner, intermediate and advanced students be characterized over the school year? Second, does the use of online writing (grammar / language) software significantly improve students's writing?

## 4. 研究成果

Research is now ongoing concerning the data received about writing that was collected during one semester in three universities in Japan and one in China.

**Achievement 4.** Characterizing the Complexity, Accuracy, and Fluency in Japanese L2 Writing; Final Results was presented at The 3rd IAFOR (The International Conference on Arts and Humanities in Hawaii (IICAH2023), January 05-08, 2023. Honolulu, Hawaii. This paper is now under review with the IAFOR (The International Conference on Arts and Humanities in Hawaii (IICAH2023), Proceedings [Scopus-indexed].

**Achievement 3.** Teacher Recommendations for Writing Programs in Japanese Universities. International Journal of Information and Education Technology, Vol. 13, No. 4. <http://www.ijiet.org> DOI: 10.18178/IJiet This was also presented at the 2022 3<sup>rd</sup> Asia Education Technology Symposium, (AETs), September 3<sup>rd</sup>-September 5<sup>th</sup>, Online (Fukuoka, Japan). <http://www.aets.net>

**Achievement 2.** Characterizing Japanese Learners' Written Complexity, Accuracy, and Fluency Over a School Year is now under review by the Journal *Assessing Writing*. This paper presented at the 5<sup>th</sup> International Conference on Teaching, Learning and Education. July 08-10, 2022, Zurich, Switzerland. URL: <https://www.ictle.com>

**Achievement 1** Online Grammar Checkers Versus Self-Editing: An Investigation of Error Correction Rates and Writing Quality. Journal of Nusantara Studies (JONUS), 7 (1), 441-458. DOI: <https://doi.org/10.24200/jonus.vol7iss1pp441-458> This paper was presented at The XVth International Conference on Business, Economics, Law, Language & Psychology (ICBELLP), September 16-17, 2021, Athens, Greece. (Online)

5. 主な発表論文等

〔雑誌論文〕 計2件（うち査読付論文 1件/うち国際共著 2件/うちオープンアクセス 1件）

1. 著者名 Robert Long	4. 巻 7(1)
2. 論文標題 Online Grammar Checkers Versus Self-Editing: An Investigation of Error Correction Rates and Writing Quality.	5. 発行年 2022年
3. 雑誌名 Journal of Nusantara Studies (JONUS),	6. 最初と最後の頁 441-458
掲載論文のDOI (デジタルオブジェクト識別子) 10.24200/jonus.vol7iss1pp441-458	査読の有無 有
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1. 著者名 Robert Long	4. 巻 in press
2. 論文標題 The Usefulness of Online Grammar Checkers	5. 発行年 2021年
3. 雑誌名 International Journal of Social Sciences (ISSN 2454-5899)	6. 最初と最後の頁 to be decided
掲載論文のDOI (デジタルオブジェクト識別子) なし	査読の有無 無
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〔学会発表〕 計5件（うち招待講演 2件/うち国際学会 4件）

1. 発表者名 Robert Long
2. 発表標題 Characterizing the Complexity, Accuracy, and Fluency in Japanese L2 Writing; Final Results.
3. 学会等名 The 3rd IAFOR (The International Conference on Arts and Humanities in Hawaii (IICAH2023) (国際学会)
4. 発表年 2023年

1. 発表者名 Robert Long & Hiroaki Watanabe
2. 発表標題 Teacher Recommendations for Writing Programs in Japanese Universities.
3. 学会等名 2022 3rd Asia Education Technology Symposium, (AETs) (招待講演)
4. 発表年 2022年

1. 発表者名 Robert Long
2. 発表標題 Characterizing Japanese Learner ' s Written Complexity, Accuracy, and Fluency Over a School Year.
3. 学会等名 5th International Conference on Teaching, Learning and Education. July 08-10, 2022, Zurich, Switzerland. (国際学会)
4. 発表年 2022年

1. 発表者名 Robert Long
2. 発表標題 The Useful Online Grammar Checker
3. 学会等名 The XVth International Conference on Business, Economics, Law, Language & Psychology (ICBELLP), (招待講演) (国際学会)
4. 発表年 2021年

1. 発表者名 Robert Long
2. 発表標題 Characterizing the Complexity, Accuracy, and Fluency in Japanese L2 Writing: Preliminary Results.
3. 学会等名 21st ICTEL2019 International conference on Teaching, Education & Learning, (国際学会)
4. 発表年 2019年

〔図書〕 計0件

〔産業財産権〕

〔その他〕

Genderfluency <a href="http://genderfluency.com">http://genderfluency.com</a>
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6. 研究組織

	氏名 (ローマ字氏名) (研究者番号)	所属研究機関・部局・職 (機関番号)	備考
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7. 科研費を使用して開催した国際研究集会

〔国際研究集会〕 計0件

8. 本研究に関連して実施した国際共同研究の実施状況

共同研究相手国	相手方研究機関
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