
Feature Article

Another Look at First-year Students' English Typing Abilities

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Abstract

Although Japan's Ministry of Education, Culture, Sports, Science and Technology has stated that the enhancement of computer skills should be a major priority in elementary and secondary education, many Japanese students arrive at the post-secondary level with very limited English typing abilities. This paper seeks to expand on the authors' preliminary study by examining the effects of typing training on the typing abilities and attitudes of first-year students at a large, private university in Japan over the course of an entire academic year. The results suggest that while these first-year students made significant gains in both typing speed and accuracy throughout the academic year, only slightly greater and statistically suspect improvements were garnered from exposure to limited direct typing training and practice in class. Other findings suggest that the amount of attention spent on typing in class may have had more of an effect on improving students' attitudes toward their own typing abilities and on typing in English in general.

日本の文部科学省は中高教育におけるコンピュータスキルの習得を最重要課題と位置づけているにも拘らず、大学教育開始時点において多くの学生の英文タイピング能力は非常に限られたものである。本稿は、著者による過去の予備研究を展開する形で、日

本の大型私立大学の1年生を対象に年間を通じたタイピング訓練がタイピング能力及び心構えに及ぼす影響を調査するものである。調査結果からは、クラスでタイピング実習を行わない統制群を含めたすべてのグループでタイピング速度及び精度の両方における有意な向上が見られたが、クラスの中での限られたタイピング実習からは統計上の有意性が疑われるほどの僅かな上達しか観察されなかった。むしろ、授業中にタイピング実習を行うことは、学生自身のタイピング能力上達の自覚や英語タイピングに対する意識の向上に大きく寄与することが示唆された。

Computers are now almost an indispensable part of college and university education in Japan. English as a Foreign Language (EFL) programs, in particular, have quickly come to rely heavily on the use of computers for the completion of coursework both inside and outside of class. Indeed, many English writing courses today are becoming increasingly geared around the use of word processing software such as Microsoft Word for the production of writing assignments and a growing number of instructors are also incorporating the use of computer-mediated communication tools such as e-mail, blogs, chat, discussion boards, and wikis into their college and university EFL coursework. For Japanese students hoping to continue their studies abroad, common standardized assessment tools such as the Test of English as a Foreign Language (TOEFL) and the Graduate Record Examination (GRE) are now more and more likely to be computer-based (Educational Testing Service, 2007a, 2007b). Given the extensive role that computers play in post-secondary EFL education in Japan, it seems that English typing skills are now more necessary than ever for Japanese college and university students.

Unfortunately, although Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) has stated that the enhancement of computer skills should be a major priority in elementary and secondary education (Ministry of Education, Culture, Sports, Science and Technology, n.d.), many Japanese students arrive at college or university with very limited English typing abilities (McDonald & Foss,

2007). While numerous authors have noted the importance of typing skills for L2 learners participating in computer-assisted instruction (Berens, 1986; Chapelle, 2003; Johnson & Brine, 2000; Li & Cumming, 2001; McDonald & Foss, 2007; van der Linden, 1993), and the role of typing ability has often been considered of importance to researchers involved with first-language computer users (Borthwick, 1993), there remains little research focused directly on typing in relation to second and foreign language learners. Of the typing-related research that has been conducted with L2 learners to date, the great majority has sought to examine the impact of word processing capabilities on the writing process and on the quality of work produced (Li, 2006; Li & Cumming, 2001), with only minor consideration given to the role of typing abilities and computing skills (Lam & Pennington, 1995; Li & Cumming, 2001).

Although these areas have often been neglected in the literature, several authors have speculated that achieving a certain degree of typing ability and basic computing skills may be necessary for effective participation in classes in which computers use is required (Berens, 1986; Hyland, 1990; Lam & Pennington, 1995; Li & Cumming, 2001; McDonald & Foss, 2007; Pennington, 1991). Some suggest that providing direct typing instruction and practice opportunities in such classes may serve to improve L2 students' typing abilities (Johnson & Brine, 2000; Lam & Pennington, 1995; Kitao, 1995; McDonald & Foss, 2007) though this suggestion has primarily been offered only as conjecture. The lone exception is the 2007 study by McDonald and Foss which attempted to examine the effects of direct typing training and practice on students' English typing abilities and attitudes toward typing in English. In this preliminary study, McDonald and Foss found that increased attention to typing instruction and practice over the course of one academic semester resulted in somewhat greater improvement in typing speed and accuracy for the first-year, Japanese university student participants and that students' perceptions of their own typing

abilities also improved. However, it is important to note that even the control group of students in this study, which did not receive any direct typing instruction or practice, demonstrated a marked improvement in their typing abilities. Also, as it was a preliminary study, no statistical analysis of the data was conducted. As a result, McDonald and Foss were unable to draw any firm conclusions about the effectiveness of typing instruction at the university level.

Methodology

Purposes

This study seeks to build on the authors' 2007 study by examining the effects of typing training and practice over the course of the entire first year for the students involved in the previous preliminary study. The purposes of this study were (1) to determine the improvement in typing speed and accuracy of the first-year student participants over the course of two semesters and (2) to further explore whether providing limited typing training and practice in writing classes results in improved typing abilities for the students involved, and, if so, the degree to which the amount of class time allotted for such training might affect the outcome. As in the previous study, questionnaires also asked the students to self-assess their typing abilities, note their sense of improvement after one academic year, evaluate the usefulness of the typing training and practice activities, and consider whether English typing skills were important to them or not.

Participants

This study was conducted during the 2007 academic year at a large private university in Japan. Students in six first-year, introductory academic writing classes served as the participants of the study (N = 144); each class was assigned to one of three groups: high attention to typing (n = 60), low attention to typing (n = 39), and control/no attention

to typing ($n = 45$). All six classes met for 90-minute class periods once a week for twelve weeks in Spring term and fourteen weeks in Fall term. All six classes were conducted in classrooms equipped with notebook computers with Internet access available for each student.

Data collection and analysis

All participants were administered typing tests at three different points of the academic year: at the beginning of the Spring term, at the end of Spring term, and again at the end of the Fall term, which was the end of the first year of study for the students involved. The typing pre- and post-tests each consisted of three 3-minute typing tests offered online by TypingMaster, (TypingMaster Finland, Inc., 2007), a well-known maker of typing training software and provider of free online typing tests. After each series of tests, all of the participants' scores for average net speed, calculated in Words Per Minute (WPM), and accuracy, calculated as the percentage of accurate keystrokes, were analyzed to determine each group's average net speed and average accuracy percentage, along with the standard deviations for each. The results of each test were then later compared to determine the improvement made by each group in terms of average net speed and accuracy. Finally, further analyses, consisting of paired t tests and a one-way analysis of variance (ANOVA), were employed to determine the statistical significance of the improvements made.

All of the participants also completed online questionnaires written in simple English at both the beginning and end of the academic year. (As the classes were conducted solely in English, it was decided to administer the questionnaires in English as well.) The initial pre-questionnaire (see Appendix A) asked all students to rate their own English typing ability according to one of the following choices: very bad, bad, average, good, or excellent. The post-questionnaires (see Appendices B and C) asked all students to rate their own English typing

ability again according to the same criteria. In addition, the post-questionnaires asked all participants if they felt that their English typing ability had improved over the year. The high attention group and the low attention group were both asked if they felt that the typing training and practice that they had received in class had helped their typing to improve on the post-questionnaire (see Appendix B), while the control group was asked if they wished they had received typing training and practice in their first-year English writing classes (see Appendix C). Also, all three groups were asked if they liked typing in English. Finally, all students were asked if they felt that English typing skills were important or not. The responses to the questionnaires collected were simply compiled into overall percentages for each group.

Training procedure

From the start of the 2007 academic year, each of the three groups in the study received a different level of typing instruction. The high attention group received approximately 15-20 minutes of typing training and practice each week for ten weeks in both the Spring and Fall semesters (150 minutes over each term; 12.8% of the total class time) using Molko's (n.d.) Free Touch Typing Program, a touch typing training website with 15 successive lessons each focused on cumulatively practicing two new typing keys, as well as Typer Shark, (PopCap Games, Inc., 2002), an online typing game with a basic version available for free. The typing training consisted of an introduction to the basic principles of touch typing early in the Spring semester. The keyboard home rows were introduced using the standard keyboard graphic on the Free Touch Typing Program website and the correct finger placement positions for each key were briefly explained. For each of the first four weeks, the students in the high attention group completed 3-4 lessons on the Free Touch Typing Program website until all the lessons were completed. After these introductory lessons were

completed, the students then accessed the online typing game, Typer Shark, for approximately 15 minutes in each of the six remaining class meetings. The instructor monitored the students throughout these practice sessions, consistently reminding them to use correct finger placement position and to look at the screen rather than the keyboard while typing. At the beginning of the Fall semester, students in the high attention group were reintroduced to the basic principles of touch typing and spent two weeks reviewing the basic lessons on the Free Touch Typing Program used previously before returning to Typer Shark for the remaining eight weeks. The low attention group accessed the same websites in class to introduce, review, and practice typing but did so for a total of only five weeks each semester (75 minutes over each term; 6.4% of the total class time). The control group did not receive any direct typing instruction or online practice. Additionally, it is estimated that students in all groups each typed approximately 2000 words related to writing course work over the Spring semester and roughly 3500 words during the Fall term.

Results

Typing improvement

The results of the typing pre-tests revealed the students' average net speeds and average accuracy levels at the beginning of the year. For the current study, the means of the group net speeds, calculated by Words Per Minute (WPM), and accuracy scores, calculated by the percentage of correctly typed characters, were determined along with the standard deviations. These pre-test results established the general level of each test group's typing abilities at the beginning of the Spring semester as newly-arrived, first-year students. At the end of both the Spring and Fall semesters, after each group had received its designated treatment of typing instruction and practice, post-tests were given. The results of the typing pre-tests, first-term post-tests, and second-

term post-tests can be seen in Tables 1 and 2, along with a summary of the difference in average improvement for each group during each designated semester.

Table 1. Pre-Test, First Semester Post-Test, and First Semester Improvement Results

Test group [N = 144]	Pre-test		First semester post-test		First semester improvement	
	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %
High attention [n = 60]	12.30 (4.60)	84.3 (10.1)	16.90 (5.20)	89.5 (5.04)	4.60 (2.58)	5.2 (9.80)
Low attention [n = 39]	15.88 (8.02)	84.7 (9.61)	19.65 (8.48)	89.3 (6.52)	3.77 (2.49)	4.6 (7.13)
Control [n = 45]	14.31 (4.44)	87.6 (6.89)	17.67 (5.84)	89.2 (6.77)	3.36 (3.80)	1.6 (9.00)

Note. Standard deviations are indicated in parentheses.

Table 2. First Semester Post-Test, Second Semester Post-Test, and Second Semester Improvement Results

Test group [N = 144]	First semester post-test		Second semester post-test		Second semester improvement	
	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %
High attention [n = 60]	16.90 (5.20)	89.5 (5.04)	19.04 (5.64)	91.2 (4.20)	2.14 (2.55)	1.7 (4.84)
Low attention [n = 39]	19.65 (8.48)	89.3 (6.52)	21.93 (8.18)	89.6 (5.28)	2.29 (2.58)	0.3 (4.78)
Control [n = 45]	17.67 (5.84)	89.2 (6.77)	20.03 (5.32)	92.0 (4.45)	2.36 (4.18)	2.8 (6.66)

Note. Standard deviations are indicated in parentheses.

As noted in the results of the 2007 preliminary study (reproduced here in Table 1, though adjusted for the smaller number of participants

that completed the entire year-long study), all three test groups' net speed and accuracy averages were shown to improve over the course of the first semester (McDonald & Foss, 2007), though it should again be noted that no analysis for statistical significance was conducted at the time. The high attention group demonstrated the most substantial apparent improvement in both mean net speed and accuracy with the low attention group showing slightly more improvement in both aspects than the control group.

The results of the second semester post-test (shown in Table 2) are much more muddled. Again all three groups appeared to demonstrate gains in their net speed averages, though less than those of the first semester, but there was little difference among the three groups in terms of net speed improvement. The accuracy of each group also seemed to improve somewhat during the second semester with the control group improving their accuracy the most and the low attention group showing only negligible improvement.

Table 3 shows the results of the second semester post-test in comparison with the initial pre-test scores to provide the overall improvement in average net speed and accuracy for each of the three test groups over the course of the entire academic year. When the improvements made by each group over the entire academic year are compared, the high attention group seemingly demonstrated the greatest improvement in both average net speed and accuracy, findings which were consistent with those of the preliminary study by the authors.

Table 3. *Pre-Test, Second Semester Post-Test, and Overall Improvement Results*

Test group [<i>n</i> = 144]	Pre-test		Second semester post-test		Overall improvement	
	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %	Net Speed WPM	Accuracy %
High attention [<i>n</i> = 60]	12.30 (4.60)	84.3 (10.14)	19.04 (5.64)	91.2 (4.20)	6.74 (3.58)	6.9 (10.38)
Low attention [<i>n</i> = 39]	15.88 (8.02)	84.7 (9.61)	21.93 (8.18)	89.6 (5.28)	6.05 (3.44)	4.9 (9.00)
Control [<i>n</i> = 45]	14.31 (4.44)	87.6 (6.89)	20.03 (5.32)	92.0 (4.45)	5.72 (2.62)	4.4 (7.06)

Note. Standard deviations are indicated in parentheses.

Despite this, statistical analysis of the full year's results revealed that the improvements within the three groups were significant, while comparative improvement between the groups were not significant. Paired *t* tests were run on the pre-test and second-semester post-test scores for each of the three groups. Regarding net speed, all three groups made significant improvements: high attention ($t=14.597$, $p<0.0001$), low attention ($t=10.994$, $p<0.0001$), and control ($t=14.627$, $p<0.0001$). Regarding accuracy, all three groups made significant improvements as well: high attention ($t=5.166$, $p<0.0001$), low attention ($t=3.383$, $p<0.0017$), and control ($t=4.230$, $p<0.0001$). However, when a one-way analysis of variance (ANOVA) was conducted for the three groups concerning overall improvements, the analysis was not significant for either net speed, $F(2, 141) = 1.336$, $p = 0.266$; or accuracy, $F(2, 141) = 1.127$, $p = 0.327$.

On the whole, the analysis of the typing test results demonstrates that all three test groups improved significantly in both their net typing speed and accuracy throughout the course of the entire academic year. However, the overall academic year results reveal only a slight and statistically insignificant improvement of +0.69 WPM and +1.02 WPM in the mean net speed of high attention group when compared

to that of the low attention group and control group respectively, and a seemingly more substantial yet also statistically insignificant improvement in accuracy of the high attention group at +2.0% over the low attention group and +2.5% over the control. Improvements in net typing speed and accuracy of the low attention group over the control group at +0.33 WPM and +0.5% were negligible.

Table 4. A Summary of the Pre-Course and Post-Course Questionnaire Results

Test group [N = 144]	Pre-course self-rating of typing ability	Post-course self-rating of typing ability	Typing ability improved	In-class practice helped	Like typing in English	Typing skills important
High attention [n = 60]	Excellent	0%	Excellent	0%		
	Good	0%	Good	8%	Y – 93%	Y – 82%
	Average	23%	Average	42%	N – 7%	N – 2%
	Bad	28%	Bad	37%	Y – 97%	Y – 98%
	Very bad	49%	Very bad	13%	N – 3%	N – 18%
Low attention [n = 39]	Excellent	0%	Excellent	0%		
	Good	5%	Good	10%	Y – 82%	Y – 100%
	Average	33%	Average	28%	N – 18%	N – 0%
	Bad	36%	Bad	41%	Y – 92%	Y – 77%
	Very bad	26%	Very bad	21%	N – 8%	N – 23%
Control [n = 45]	Excellent	0%	Excellent	2%	Wish had in-class practice	
	Good	2%	Good	0%	Y – 78%	Y – 64%
	Average	22%	Average	38%	Y – 80%	Y – 96%
	Bad	40%	Bad	42%	N – 20%	N – 4%
	Very bad	36%	Very bad	18%	N – 22%	N – 36%

Attitudes

The responses to the pre- and post-questionnaires were collected and analyzed according to the percentage of respondents in each

group, as seen in Table 4. The first column represents the students' pre-rating of their own typing abilities at the beginning of the academic year while the second column represents their post-rating at the end of the year. The third column reveals each group's sense of improvement in English typing skills at the end of the academic year. The fourth column represents the reaction of the high attention and low attention groups toward the limited typing instruction and practice conducted over the course of the year, as well as the control group's wish to have studied and practiced typing in class. The fifth column shows each group's affinity toward typing in English. Finally, the last column reports each group's overall sense of importance of English typing skills at the end of the academic year. No statistical analysis was conducted on the questionnaire results.

The questionnaire responses reveal a great deal about the students' attitudes toward typing and their own abilities as typists. First, most of the first-year students involved in this study had a low self-assessment of their own English typing abilities both at the beginning and end of the academic year, though the students in the high attention group did rate themselves noticeably better at the end of the year with 50% of this group's respondents considering themselves to be average or better English typists, presumably only when compared to their peers. While a great majority of the students involved in the study felt that their typing abilities had improved over the year, the percentage was again higher for the high attention subjects as 93% noted an improvement, compared to 82% of the low attention group and 80% of the control group. When asked if the typing lessons and practice done in class had helped them improve, nearly all students in both the high attention and low attention groups felt that it had been valuable. On a related note, 78% of the students in the control group stated that they wished they had received typing instruction in class, a sizeable portion of that test group. Interestingly, one of the more obvious differences between the groups can be seen in their responses to the question which asked

whether they liked typing in English or not. Here the results show almost a gradient of affinity for typing in English from a low of 64% for the control group, to 77% for the low attention group, and up to a high of 82% for the high attention group. Finally, nearly all of the students involved in the study saw English typing skills as important at the end of the academic year, with over 97% of all participants noting the importance.

Discussion

The analysis of the results indicates that a majority of participants in this study made considerable improvements in both their English typing speed and accuracy over the course of their first year at university even without direct typing instruction and focused practice opportunities, presumably due to the increased demand for typing in English. While the improvements made by the high attention group of this study were not significantly more than those of the low attention and control groups in terms of increased typing speed and accuracy, the class time dedicated to such typing instruction and practice opportunities was seen as valuable by the participants and may have possibly affected both the students' assessment of their own typing abilities and their affinity towards typing in English in a positive way. Although the specific effects of improved self-assessment and greater affinity toward typing in English are beyond the reach of this study, they may well serve to improve the students' future attitudes toward typing in English and, perhaps, spur on greater development for such students down the road. Clearly, further research is needed to more adequately examine these potential effects as well as to more concretely determine the most effective ways to address English typing skills at the post-secondary level in Japan.

While this study outlines two variations of a way in which first-year university students can be introduced to the basics of English touch

typing through limited training and practice opportunities using two free, online typing training websites within the context of a weekly EFL writing course, there is undoubtedly a wide range of alternative approaches that may reap greater rewards. Indeed, any number of books and software claiming to teach these skills are widely available and may be more effective than the free websites utilized in this study. Though this study does not seek to make any definitive claims regarding the best ways to teach touch typing skills, it seems that several suggestions can be made. Ideally, and congruent with MEXT's stated goals, touch typing skills should be introduced at the elementary and secondary level in the students' native language with ample practice opportunities for the students to develop their proficiency under less stressful conditions than may be present later at the post-secondary level. If this important training remains lacking at these earlier stages, however, perhaps an entire semester dedicated to more intensive typing and computer training early on in students' university careers would prove worthwhile either in the students' native language or as the subject matter of a content-based EFL course. Alternatively, perhaps simply increasing the amount of typing required by first-year students may be enough to stimulate a faster rate of improvement, though clearly affective considerations and the meaningfulness of the material must be taken into account here as well. Ultimately, it seems that instructors must carefully consider their own unique teaching contexts, complete with the program aims and requirements, student goals, time and budget constraints, and availability of technology, when deciding on how best to address English typing skills at the university level, if at all.

Limitations

While both the typing test results and questionnaire responses provide data that goes a long way toward addressing the purposes set

forth at the outset of this study, it must be noted that there are also several limitations in the way in which this study was conducted. First, because the three groups of participants involved in this study were culled from intact first-year English writing classes which were not randomly assigned, the experiment itself may have a weakened internal validity. Also, the online typing test at the center of this study may have been intimidating to many participants, especially as the initial pre-test was administered in many of these students' first university-level English classes. As many of the students lacked familiarity with computer applications at the time, it is highly possible that such a demanding computer-based task may have negatively affected their results. (Although if this is the case, it further underscores the need for computer skills/typing training at the university level in Japan.) Similarly, though beyond the scope of this study, the relationship between typing experience and ability in a native language may be intrinsically linked to comparable abilities in a foreign language and may have a dramatic impact on how quickly progress is made. Likewise, the amount of typing done by the participants on their own throughout the course of the study, both in the native language and in English, was not accounted for. Finally, it must be acknowledged that the simplicity of the questionnaires, while intended to allow the low-level English language students serving as the participants of this study to more easily understand and respond to the questions posed, may have influenced the responses and unduly biased the results. In retrospect, a more detailed questionnaire written in Japanese may have been more appropriate, at least as far as this research study is concerned. Though these limitations are worth noting, it is believed that several important conclusions can still be drawn from this study.

Conclusion

Despite MEXT's stated priority for the enhancement of computer

skills during elementary and secondary education, it is clear that many students arrive at the post-secondary level with severely limited English typing abilities. Though these students may be acutely aware of their own limitations as typists, it is becoming increasingly likely that such students will be required to type in English to complete university-level EFL computer-based coursework. As a result, the transition to such coursework may be a frustrating one for many students. Fortunately, as this study shows, most students will make substantial gains in both typing speed and accuracy throughout their first year even without direct attention paid to typing in class. While it remains unclear whether or not increased attention to typing training and practice is entirely worth the investment of class time required, its potential positive effects on students' attitudes towards their own typing abilities can also not be overlooked. Though many questions about the most effective ways to improve the English typing skills of first-year university students remain yet unresolved, university EFL instructors should at least be aware of their incoming first-year students' presumably limited English typing abilities and sensitive to such limitations when considering related required coursework.

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Appendix A

Pre-Course Self-Rating of English Typing Ability Questionnaire

1. How would you rate your typing abilities when typing in English?
 - Excellent
 - Good
 - Average
 - Bad
 - Very Bad

Appendix B

Post-Course Questionnaire (High Attention/Low Attention)

1. How would you rate your typing abilities when typing in English?
 - Excellent
 - Good

- Average
 - Bad
 - Very Bad
2. Do you feel that your English typing ability got better this semester?
- Yes
 - No
3. Do you feel that the typing lessons and practice done in this class helped you to get better at typing in English?
- Yes
 - No
4. Do you like typing in English?
- Yes
 - No
5. Do you think English typing skills are important?
- Yes
 - No

Appendix C

Post-Course Questionnaire (Control)

1. How would you rate your typing abilities when typing in English?
- Excellent
 - Good
 - Average
 - Bad
 - Very Bad
2. Do you feel that your English typing ability got better this semester?
- Yes
 - No
3. Do you wish you had English typing lessons in class?
- Yes
 - No
4. Do you like typing in English?
- Yes
 - No
5. Do you think English typing skills are important?
- Yes
 - No