Short Research Papers

Have Smartphone Will Travel: Study Abroad In The Age Of Mobile Technology

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The researchers investigated Japanese students' perceptions and usage of mobile devices (i.e., smartphones, MP3 players, e-book readers, tablets, and portable game consoles) for informal English-language learning before and after a study-abroad experience. A survey instrument was used to collect responses from 31 undergraduate and graduate students at four universities. Responses on the Dimensions of Mobile-Assisted Language Learning (MALL) scale, which examined personalization, authenticity, and connectivity, showed that the means of the total scale and subscales all increased following study abroad, but significant changes were only found in the total scale and personalization subscale. Changes were also observed in usage of mobile devices, time spent learning, and the activities in which participants engaged. Furthermore, participants' purpose shifted from self-directed learning to incidental learning after study abroad.

海外留学経験の前後で日本人学生のインフォーマル英語学習のためのモバイル機器（例えばスマートフォン、MP3プレーヤー、電子書籍リーダー、タブレット、ポータブルゲーム機）に対する態度と使用について調査した。アンケート調査は日本の4つの大学の大学生と大学院生、合計31人から回答を得た。パーソナル化（Personalization）、真正性（Authenticity）、連結性（Connectivity）を考察するDimensions of MALLスケールの回答では、全体スケールと部分スケールのすべてで留学後の中央値が上昇した。しかし、統計的有意性は、全体スケールとパーソナル化・部分スケールでのみ確認された。モバイル機器を使った学習時間や人と

のつながりのための活動に関しては変化も見られた。さらに、留学後のモバイル機器の使用目的は、自己学習から偶発的学習へと移行した。

A study-abroad experience is often seen as a great opportunity for informal language practice. Students are thought to experience immersive, out-of-class language, something not usually available (Reinders & Benson, 2017). But even while participating in study-abroad programs, many students find that the most practice of their L2 still takes place in the language classroom (Cotterall & Reinders, 2001; Goodwin-Jones, 2016). This suggests the idea that one of the more important benefits of study-abroad programs is not a change in physical space but an increase in digital space. Unlike in-person contact with people abroad, which is severely limited once the student returns to their home country, digital interactions can continue with few barriers. These interactions might take the form of communication facilitated by technology with individuals and groups that the students have formed social relationships. There may also be an increase in consumption of English-language media once back in their home country, such as TV shows and music, to which they were exposed during their period of study abroad.

Language learning takes place beyond the classroom (LBC) (Reinders & Benson, 2017). Isbell (2018) went so far as to state, "It is fairly uncontroversial to claim that most language learning occurs outside the classroom" (p. 82). Benson (2011) noted that, "there is no strong reason to suppose that out-of-class learning is any less effective than classroom learning" (p. 8). Benson (2011) further observed that when language learning and teaching take place beyond the classroom, the locus of control is autonomous, independent, and self-regulated—words not often heard in the EFL classroom. Goodwin-Jones (2019) described the choice of materials and methods available to those participating in informal language learning as "nearly unlimited" (p. 10). Use of technology in language learning may also foster motivation in L2 learners (Honarzad & Rassaei, 2019).

Informal contexts can be viewed as working in conjunction with formal contexts (Cotterall & Reinders, 2001; Benson, 2011; Reinders & Benson, 2017).

As technology continues to evolve, our understanding of LBC must evolve with it. LBC can now be thought of as either physically or digitally outside of the classroom; for example, by accessing the internet through mobile technology, a space with many undocumented settings for LBC (Reinders & Benson, 2017).

Changing views on the role of social networking sites (SNSs) and education are leading to a focus on their educational benefits. Hamat and Hasan (2019), in their study of Malaysian university students' use of SNSs for language learning, found that 99.7% of students surveyed (n = 6,085) used SNSs to practice English outside of the classroom, and 97.4% believed that use of SNSs helped them improve their English. On a five-point Likert scale, ranging from "Not helpful at all" to "Extremely helpful," their students perceived the use of SNSs as being "Very helpful" in strengthening writing, communication, vocabulary, and reading (mode = 4), but not for grammar (mode = 2 ["Slightly helpful"]) and listening and speaking (mode = 1 ["Not helpful at all"]).

With many of today's students being digital natives (Prensky, 2001a), an opportunity has arisen for instructors to teach in a way that is familiar to the students, namely, through the use of mobile-assisted learning (MALL). Indeed, it seems that not only do students learn differently, but that their brains themselves develop in a way that matches their learning preferences (Prensky, 2001b). Failure to take this into consideration may lead to instructors spending more time accusing their students of having short attention spans and less time producing engaging, meaningful content tailor-made for this new kind of student (Prensky, 2001b). New content for 21st century students can be delivered where they spend their time, that is, on their phones.

According to the Japanese Ministry of Communication's (MIC, 2018) data regarding access to mobile devices, 95.7% of families in Japan have access to one or more mobile devices. The most prevalent device was the mobile phone of which 79.2% were smartphones. Data regarding access to other mobile devices among Japanese households were as follows: tablets (40.1%) and MP3 players (14.2%). Information regarding e-readers and portable game consoles was not specifically identified in the MIC white paper, but home game consoles and other mobile devices were owned by over 30% and 6.9% of Japanese households,

respectively.

In their extensive meta-analysis on the integration of mobile devices and student learning performance, Sung et al. (2016) suggested the use of mobile devices in education as a way of bridging formal and informal learning contexts. In their study of mlearning scaffolding and bridging of formal and informal contexts, Lim Abdullah et al. (2013) quoted a students' reflection on the autonomy afforded by their methods, "You are given the trust to handle what you need to learn. I feel like my own boss" (p. 229). Today's internet-enabled smartphones allow for EFL students to engage directly with other English speakers (Forsythe, 2013; Honarzad & Rassaei, 2019), solving the problem of access. MALL provides learners with opportunities for familiar, authentic environments in which to engage with their L2 (Shadiev et al., 2020), opportunities which can occur at a time, pace, and place of the students' choosing (Honarzad & Rassaei, 2019).

Sung et al. (2016) noted that the computing power, portability, wireless communication, and context sensitivity tools make "one-to-one computing a learning tool of great potential in both traditional classrooms and outdoor informal learning" (p. 252). Their meta-study of the literature found that "69.95% of learners using a mobile device performed significantly better in dependent variables related with cognitive achievement than those not using mobile devices" (p. 257), and that "learning with mobiles is significantly more effective than traditional teaching methods that only use pen-and-paper or desktop computers" (p. 257). Additionally, they observed that inquiry-oriented learning was the most effective type studied, and informal learning environments were more effective than formal. Mills (2016) noted several advantages that computer-assisted language learning (CALL) may offer to Japanese learners of English, including, "unlimited access to authentic content, learning resources, and communication opportunities in the target language" (p. 3). Mills also highlighted that because interactions can often be anonymous, learners may be willing to take more risks, which may lead to a decrease in foreign-language anxiety and an increase in willingness to communicate in the target language.

So, rather than cede all learning to out-of-the-classroom environments,

instructors should try and link in-class and out-of-class learning to better bolster both (Reinders & Benson, 2017). And a great tool to link these environments is the ubiquitous smartphone.

The purpose of this research was to ascertain how Japanese university students' perceptions towards informal MALL and usage of mobile devices for self-directed and incidental learning changed following a study-abroad experience. To this end, two research questions were posed:

1. What are Japanese university students' perceptions of mobile devices for informal English-language learning before and after a study-abroad experience?
2. What are Japanese university students' usage of mobile devices for informal English- language learning before and after a study abroad experience?

Methods

In order to collect the data, the researchers posted an open call on social media (private Facebook group) to educators who taught at Japanese universities and had students who had recently experienced study abroad. Three professors/educators agreed to distribute the research instrument in their classes. A link was provided, and they shared it with their students on their courses' learning management system. Data was collected over a one-week period in the spring semester. The educators were instructed to inform their students that participation was voluntary and anonymous and would not affect their grade in the class. A description of the research as well as the rights of participants was included in the instrument.

The population included students from four universities in Japan. Two of the universities were private institutions, while the other two were public. The first is a private women's university with two campuses located in western Japan. In 2019, it had 6,538 students enrolled in undergraduate and graduate programs and 836 faculty members. This university reports that there are over 40 study-abroad programs available to its students. The second private university was a co-educational institution located in eastern Japan. The student population in

2019 was 27,404, and the number of faculty was 1,789. This university offers 59 study-abroad programs to its students to 20 countries. The first of the public universities is located in Honshu. The student population and faculty at this university were 3,813 and 250, respectively; in 2019, 75% of students who graduated in that year participated in study abroad. The second public university was extremely small but located in Tokyo. There were only 211 students who attended in 2019; they were taught by 56 faculty members. This university offers five study-abroad programs.

Thirty-one students chose to complete the survey. The majority of them were female (87.1%). They ranged in age between 20 and 24 (M = 21.22). All but one of the students was of Japanese nationality. Over 90% of the participants were studying at one of the two private universities and were in their fourth year of undergraduate study, but one student was in their third year, and two were graduate students. One of the participants was not enrolled in a Japanese university at the time but was auditing a class at one of the universities where the research took place. Most participants (n = 26) studied abroad in either Canada or the United States, and one participant studied in both. The rest of the participants studied in Australia (n = 2), the United Kingdom (n = 1), or Russia (n = 1). The period of study abroad was between 1 and 12 months (M = 9.62 months, SD = 3.06).

A questionnaire was used to collect data via Google Forms. The instrument consisted of four sections: (1) Dimensions of MALL usage, (2) Frequency of informal MALL usage of devices and activities, (3) demographics, and (4) an open-ended question. Sections one and two asked participants to provide two responses for each item: one response which corresponded with their perceptions and/or actions before studying abroad and one after their study-abroad experience.

The Dimensions of MALL instrument was developed by Lai and Zheng (2017). The researchers asked for and received permission to adapt and translate the instrument. The scale consists of 16 items divided into three categories: (1) personalization, (2) authenticity, and (3) connectivity. An exploratory factor analysis showed that these three dimensions accounted for 62.2% of the

respondent's variance in out-of-class MALL usage (Lai & Zheng, 2017). Each item in the instrument utilized a six-point Likert scale with 1 corresponding with "strongly disagree" and 6 indicating "strongly agree."

The Frequency of Informal MALL Usage was developed by one of the authors based on previous research (Patten, et al., 2006; Cheung & Hew, 2009; Santos & Ali, 2011) and his experience as a university professor in Japan. Participants were asked how often they engaged in a variety of informal learning activities (i.e., watching movies, listening to music, using learning applications, etc.) and employed certain mobile devices for these activities. For this study, mobile devices referred to smartphones, MP3 players, e-book readers, tablets, and portable game consoles. Responses were recorded using a five-point Likert scale with the responses of (1) *never*, (2) *rarely*, (3) *occasionally*, (4) *frequently*, and (5) *very frequently*. In addition, this section included a number of multiple-choice and open-ended questions pertaining to mobile device ownership, time spent engaging in informal study, and whether that study was performed consciously or unconsciously.

The third section of the survey instrument consisted of seven demographics questions: (1) age, (2) nationality, (3) gender, (4) university, (5) class standing (year), (6) location of study abroad, and (7) length of study abroad.

The fourth and final section of the survey contained one open-ended question. Here, participants were asked to explain how their use of mobile device for informal language learning changed due to their study-abroad experience.

A native speaker of Japanese with a high proficiency of English and a graduate degree in education translated the survey instrument and responses. A panel of two other native Japanese speakers with similar qualifications reviewed the first translation and gave feedback to the first translator. The instrument was adjusted based on these suggestions. Reliability coefficients were calculated for the Dimensions of MALL and Frequency of Informal MALL Usage scales. Table 1 outlines the Cronbach's alpha for each pre- and post-study-abroad scale and subscale.

After data collection was complete, the researchers transferred the information to a worksheet in IBM SPSS Statistics version 25. Responses to

Table 1
Reliability coefficients for Dimensions of MALL and Informal MALL Usage Scale

Source	Pre-study abroad	Post-study abroad
Dimensions of MALL	.901	.919
Personalization	.811	.869
Authenticity	.720	.808
Connectivity	.903	.902
Informal MALL Usage	.811	.632

the open-ended questions were organized in a Microsoft Excel spreadsheet. Frequencies were calculated for all items and negatively worded items were recoded. Descriptive statistics were computed for all items as well as the Dimensions of MALL scale and subscales and the Informal MALL Usage scale. Paired *t*-tests were used to determine if responses to the scale items before and after study abroad were significantly different. The open-ended responses before and after study abroad were examined by creating categories and organizing the information based on these themes (Johnson & Christensen, 2012).

Results

Research Question 1: Perceptions Before and After Study Abroad

Personalization. Data is shown in Table 2. Prior to studying abroad, 90.3% of participants agreed with the statement "Mobile devices help me comprehend and use the target language whenever and wherever I need it." Participants also indicated strong agreement with items 2 (83.9%), "Mobile devices enable me to learn the language at any time and any place" and item 7 (87.1%), "Mobile devices increase my autonomous learning of the language." The item with the lowest percentage of "agree" responses was 1 (54.8%), "Mobile learning gives immediate support to my language learning." After study abroad, the highest number of "agree" responses were seen with items 4 (93.5%) and 7 (90.3%).

Table 2
Means and Standard Deviation of Personalization Items Before and After Study Abroad

Item	Before		After	
	M	*SD*	*M*	*SD*
1. Mobile learning gives immediate support to my language learning.	3.81	1.33	4.42	1.46
2. Mobile devices enable me to learn the language at any time and any place.	4.71	1.10	4.87	1.20
3. Mobile devices help me comprehend and use the target language whenever and wherever I need it.	4.94	.96	5.03	.983
4. Mobile devices enable me to have self-paced, personalized language learning outside the classroom.	4.65	1.23	5.10	.944
5. Mobile learning is a flexible method of learning, as it can be done anytime, anywhere.	4.45	1.34	4.84	1.19
6. Mobile devices help extend my language learning experience beyond the language class.	4.32	1.25	4.77	1.12
7. Mobile devices increase my autonomous learning of the language	4.52	1.26	5.10	.98
8. Mobile devices provide opportunities to act independently in learning the target language	4.55	1.23	4.87	1.09

These items were concerned with the use of mobile devices to provide self-paced and personalized learning experiences and increase autonomy.

Authenticity. Responses to items in the authenticity sub-scale showed less agreement than personalization (Table 3). The highest rated item before study abroad pertained to the authenticity of experience when using mobile devices for language learning; however, only a small majority of participants expressed agreement with this sentiment (54.8%). Less than 50% of respondents believed that mobile devices increased participation in target language social communities and increased the authenticity of learning materials. The lowest rated item

Table 3
Means and Standard Deviation of Authenticity Items Before and After Study Abroad.

Item	Before		After	
	M	*SD*	*M*	*SD*
9. Mobile devices make my language learning experience more authentic.	3.61	1.23	3.97	1.602
10. Mobile devices enhance my willingness to participate in social events hosted in the target language.	3.23	1.43	3.52	1.26
11. Mobile devices increase my participation in target language social communities.	3.77	1.45	4.48	1.41
12. Mobile devices enhance the authenticity of my language learning resources and activities	3.77	1.26	3.77	1.36

(38.7% agreement) was 10. After a study-abroad experience, participants' agreement with items in this construct increased slightly. All items showed over 50% agreement with the statements. The most agreement was seen with items 9 and 11.

Connectivity. Responses to the connectivity sub-scale were more positive than those of authenticity (Table 4). The most positive responses were seen prior to study abroad with item 16 (61.3%), "Mobile devices enhance my connection with the target language community." A majority of participants also agreed that mobile devices can enhance their interaction with others in English (58.1%). However, they were less positive that mobile devices increased connection with their peer language learners (45.2%). Following the study-abroad experience, agreement with the connectivity subscale increased to over 60% in all items. The highest agreement was seen with items 13 and 16.

Dimensions of MALL Scale and Subscales. An increase in mean value was seen in all subscales and the total scale after the study-abroad experience. Paired *t*-tests were used to determine if responses to the Dimensions of MALL items before and after study abroad were significantly different. The results indicated that the Dimensions of MALL total scale mean was significantly higher after

Table 4
Means and Standard Deviation of Connectivity Items Before and After Study Abroad

Item	Before		After	
	M	*SD*	*M*	*SD*
13. Mobile devices enhance my interaction with others in the target language.	4.10	1.45	4.55	1.69
14. 1Mobile devices enhance my connection with peer learners of the target language.	3.81	1.38	4.10	1.51
15. Mobile devices connect me with speakers of the language.	3.58	1.36	4.03	1.50
16. Mobile devices enhance my connection with the target language community.	3.81	1.38	4.13	1.48

study abroad (M = 4.47, SD = .89) than before (M = 4.10, SD = .82), t(30) = -2.36, p = .02. The mean for the subscale of personalization was also significantly greater post study abroad (M = 4.87, SD = .81) than pre study abroad (M = 4.49, SD = .79), t(30) = -2.34, p = .02. Figure 1 shows the mean values of each dimension ranked in order as well as the means of the total scale.

Research Question 2: Usage Before and After Study Abroad

Before study abroad, 25.8% of participants studied informally using mobile devices for more than six hours a week. After the study-abroad experience, over 45% of participants reported spending more than six hours a week learning English with their mobile phones. Figure 2 shows the hours spent engaging in informal MALL before and after study abroad.

The researchers also observed a change in whether or not they engaged in conscious (self-directed) or unconscious (incidental) learning. Prior to study abroad, only 45.2% of participants stated that they engaged in unconscious study activities, such as watching movies and listening to music in English or communicating with English speaking friends on social media. After study abroad, unconscious learning accounted for 80.6% of their usage. This change was also evident in the open-ended responses of participants. One respondent

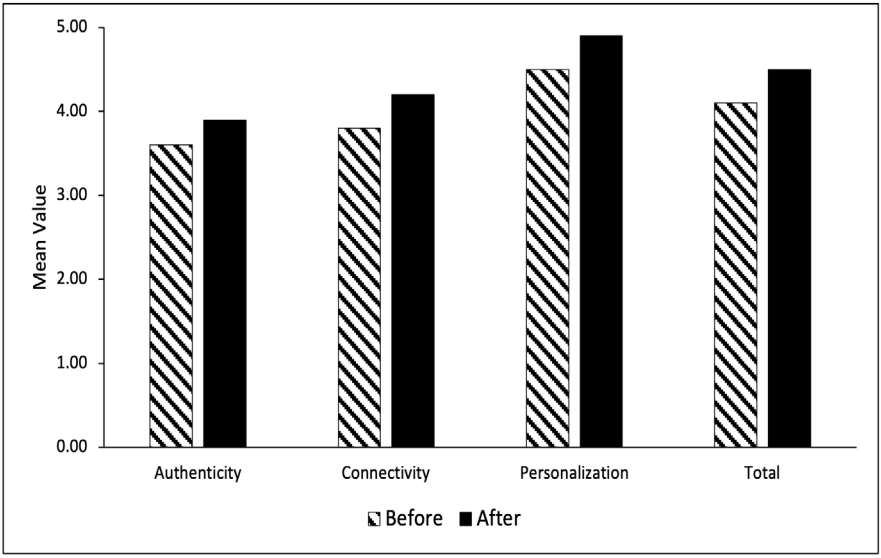

*Figure 1. P*erceptions towards informal mobile-assisted English-language learning before and after a study-abroad experience.

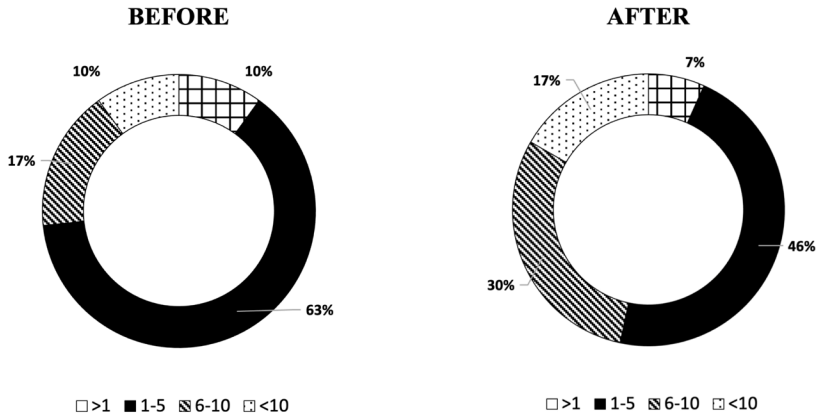

Figure 2. Hours spent engaging in informal mobile-assisted English-language learning before and after a study abroad experience.

wrote:

"I use same devices as before my study abroad but the purpose of using them has changed. Before, I used mobile devices for the purpose of studying English, but after, I used them for entertainment and just part of daily life without the

intention of learning English."

Another explained:

"Before study abroad, I read English articles though SNS or watched movies to improve my English skill. After study abroad, I read articles and watched movies without the intention of learning, but actually, with the same feeling as when I read and watch in Japanese."

Mobile phones were the most used devices for informal MALL, while portable game consoles were the least frequently used. Although the usage of mobile phones and portable game devices remained unchanged after the study-abroad experience, there was a decrease in usage of MP3 players by 3.2% and an increase in e-readers by 9.7% and tablets by 6.5%. A visual representation of these changes can be seen in Figure 3.

Finally, usage was significantly higher after a study-abroad experience (M = 3.37, SD = .54) than before (M = 3.00, SD = .76), $t(30) = -3.31$, $p < .01$. In addition, the types of activities that the participants engaged in for informal learning changed. The researchers observed the greatest increases after study abroad in usage of English language websites, video (e.g., YouTube), news, and SNSs. Smaller increases were seen with learning applications, music, audio (e.g., podcasts), and movies/TV. Figures 4 and 5 show the frequency of usage of each

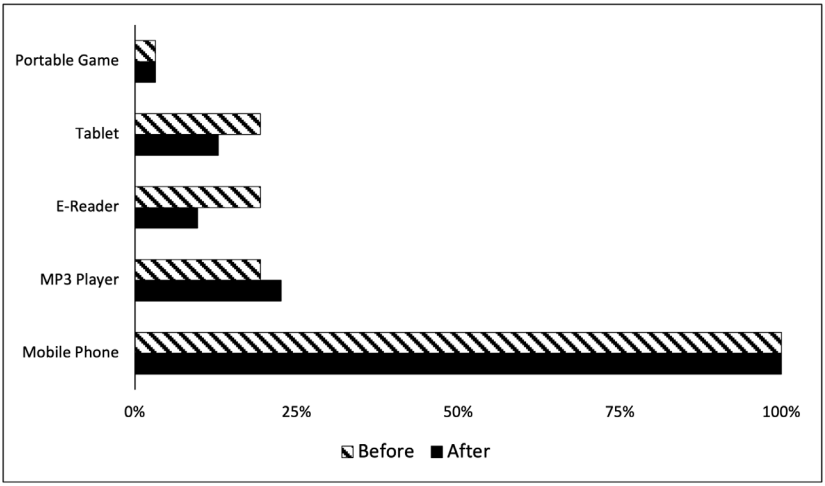

Figure 3. Usage of informal mobile-assisted English-language learning devices before and after a study abroad experience.

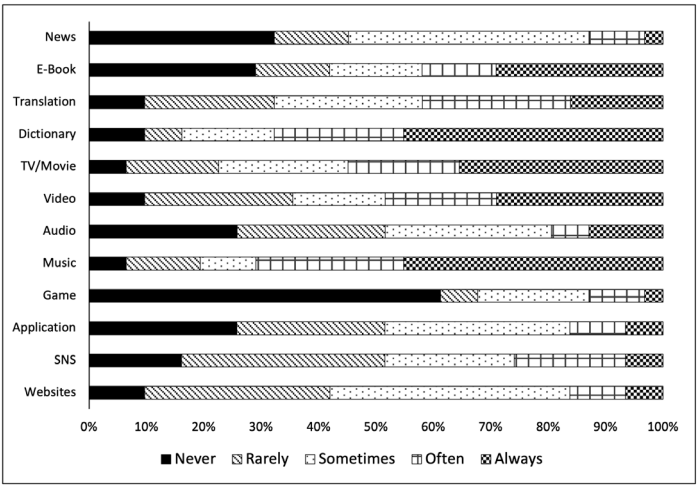

Figure 4. Engagement in informal mobile-assisted English-language learning activities before a study abroad experience.

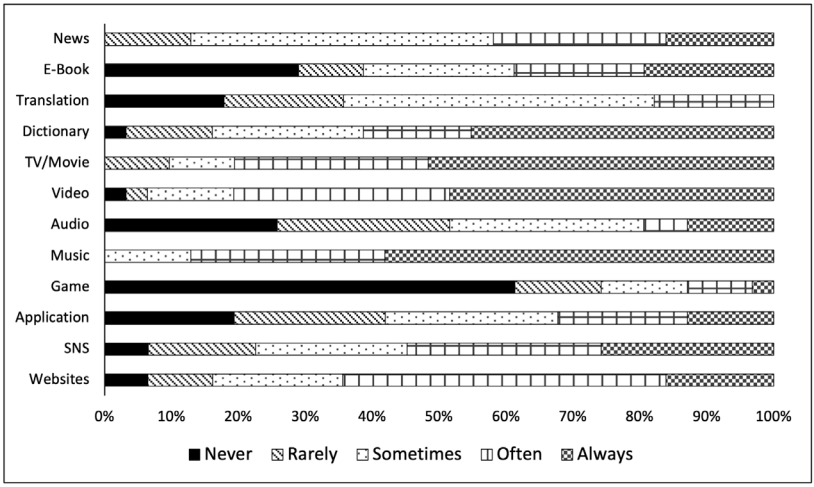

Figure 5. Engagement in informal mobile-assisted English-language learning activities after a study abroad experience.

activity before and after study abroad.

Discussion

Participants' agreement that mobile devices help extend learning beyond the walls of the traditional classroom echoes work by scholars on the expanding

nature of informal learning (Reinders & Benson, 2017; Isbell, 2018; Goodwin-Jones, 2019; Honarzard & Rassaei, 2019). The participants' views on mobile devices should help motivate instructors to embrace this change, integrating formal and informal learning through the use of mobile technology (Cotterall & Reinders, 2001; Sung et al., 2016). Students' perceived increase in autonomy and independence is in line with other findings (Benson, 2011; Lim Abdullah et al., 2013).

The difference in agreement levels between authenticity and connectivity is unexpected, given their similarity and the many affordances for authenticity discussed in the literature (Forsythe, 2013; Mills, 2016; Shadiev et al., 2020). This could be due to changing views on the use of mobile phones for education. While White and Mills (2011, 2014) noted that their students at a Japanese university did not view their smartphones as educational tools, smartphones have become more convenient and affordable since then. Perhaps as students become more comfortable with their phones as educational devices, which the high level of agreement under personalization implies (Figure 1), they will find their engagement on mobile devices more authentic.

The data regarding engagement following a study-abroad program (Figure 5) reinforces the fact that students were utilizing English to consume authentic content rather than simply engaging in self-directed study of the language. In particular, it was interesting to see that the study-abroad experience led to greater use of social networking sites in English. It has been proposed that SNSs are valuable to language learners because they provide a space to experience the target language in an informal and authentic environment as well as a way for study-abroad students to maintain social connections that were established during their trip (Kitano et al., 2019). These results also showed a change from previous research in informal MALL that indicated SNSs to be an underutilized resource in the target language, despite the fact that almost 80% of Japanese between the ages of 20 to 29 use such sites in their native language (MIC, 2018).

The results of the inferential analysis showed that study abroad had a positive and significant effect on participants' attitudes towards and usage of mobile devices for informal language learning. However, it was interesting that only the

total Dimensions of MALL scale and subscale of personalization significantly increased after study abroad. The response to the usage items in this study clearly indicated that the participants were engaging in more incidental learning where they were using English as a means to enjoy entertainment or get information rather than purposely studying the language. Usage of social media in English also increased after study abroad, which was assumed to be for the purpose of keeping in contact with people they met during their trip. The fact that the responses to the subscales of authenticity and connectivity did not increase significantly after study abroad, but actual usage of mobile devices for these purposes did, seems to suggest a disconnect between participants' perceptions and practice.

Conclusion

The purpose of this study was to determine how Japanese university students' perceptions towards and usage of mobile devices for informal English-language learning changed following a study-abroad experience. The results showed that participants' responses to the Dimension of MALL scale increased for the total scale and all subscales after returning from study abroad. However, only the total scale and the subscale of personalization showed a significant difference in the mean in the post-trip survey. The researchers also observed an increase in responses regarding usage including the time with which students engaged in informal MALL as well as the device and activities they chose. Furthermore, a majority of students had shifted from self-directed study of English with their mobile devices to incidental study once they had completed their study abroad experience. Finally, a significant difference was found between the pre- and post-survey means for the total MALL Usage scale.

While the researchers endeavored to create a study that could be extrapolated to the larger population of Japanese undergraduate and graduate students studying abroad, there were several limitations that must be noted. First, a relatively small sample size was used for the study. For this reason, incidental statistics should be viewed as preliminary. In addition, there is a possibility of self-selection bias in the study because the participants were all volunteers. Finally,

the responses gathered in this study were done so at one point in time after the study-abroad experience. This means that participants needed to self-report what they remembered to be their perceptions and usage of informal MALL before their trip. Future research needs to be done with a larger randomized sample of individuals, and data should be collected before, during, and after the study-abroad experience. It is the hope of the researchers, however, that the study presented here does identify key issues pertaining to informal language study following a study-abroad experience and will serve as a springboard from which future studies can be conceived.

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