The Effects of a Mobile-based Multisensory Approach to Vocabulary Learning in a Japanese EFL Context

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Abstract

This article reports on a 16-week study that examined the effect of mobile-based authentic audiovisual materials (AAM) on the vocabulary acquisition of Japanese university English as a Foreign Language (EFL) students. A quasi-experimental pretest-posttest design study was employed to compare the differences in vocabulary learning between a control and treatment group, as well as those between below and above average achievers in the treatment group. The study included a sample of 66 non-English majors from the Engineering and Environmental Studies departments at a flagship university in southwestern Japan. The mobile-based AAM were drawn from YouTube and aligned with vocabulary from the textbook used by both groups. Intralingual subtitles and task-based comprehension questions accompanied each of the eight AAM treatment sessions. In class, both groups activated their vocabulary knowledge through group discussion and short presentations. The achievement data were gathered from a 20-item multiple-choice and short-answer vocabulary test. Results indicated the intervention had a significant positive impact on vocabulary learning. Further analysis revealed prior vocabulary knowledge was not predictive of vocabulary acquisition, which led the authors to conclude the intervention was equally effective for low and high achievers. Other pedagogical implications of this study and suggestions for future research are discussed.

Key words: multisensory learning theory, authentic audiovisual materials, vocabulary, intralingual subtitles, higher education

Introduction

Vocabulary knowledge is the linchpin of communication (Schmitt, 2010). As Wilkins (1972) observed, "while without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (pp. 111–112). Researchers have linked vocabulary knowledge to listening (Bonk, 2000; Stæhr, 2009), speaking (Koizumi & In'Nami, 2013; Ola, Manalo, & Greenwood, 2009; Saito, 2017), reading (Hu & Nation, 2000; Shibasaki, Tokimoto, Ono, Inoue, & Tamaoka, 2015), and writing proficiency (Karakoç & Köse, 2017). The fact that the most popular language learning applications, such as Duolingo and Memrise, explicitly teach vocabulary while only providing incidental grammar instruction implies learners recognize the importance of developing a rich lexicon.

Despite the Ministry of Education's (MEXT) aggressive English vocabulary targets for secondary students, lexical knowledge stagnates or even regresses between the first and third years of high school (Akase & Uenishi, 2015). Among science students, such as the participants in this study, vocabulary knowledge continues to decline between the first and second years of university (McLean, Hogg, & Rush, 2014). This trend is especially problematic in light of MEXT's (2014) ambitious *Tobitate* (i.e., outbound study abroad) and *Top Global University Project* (i.e., English medium of instruction – EMI) policies, for which a substantial aural vocabulary is crucial (Bradford, 2016; Nation, 2013; Uchihara & Harada, 2018). Fujimura, Takizawa, and Wakamoto (2010) argue that sluggish vocabulary development is due to the persistence of rote memorization methods. Japanese EFL teachers and students reflexively adopt the same cramming and repetition strategies used for learning *kanji* (i.e., the logographic character system adopted from Chinese) to learn English vocabulary (Barfield, 2012; Tahira, 2012). Without context, students fail to internalize the dynamic interplay between word form, word meaning, and word use (Nation, 2013). Consequently, EFL students with scant exposure to authentic language use struggle to employ vocabulary correctly in authentic situations.

Online resources offer a possible solution to limitations faced by learners in "culturally and linguistically homogeneous" contexts (Aubrey & Nowlan, 2013, p. 129). Unfortunately, Japanese universities have been reluctant to adopt digital tools, so little is known about online vocabulary learning in Japan besides the low digital literacy of its so-called digital natives (Mehran, Alizadeh, Koguchi, & Takemura, 2017; Son, Park, & Park, 2017). Watkins and Wilkins (2011) proposed that Youtube would be especially beneficial for Japanese EFL learners' vocabulary learning, but to the authors' knowledge, no study has yet been conducted in Japan. The aim of this quasi-experimental quantitative study is to examine the effects of a mobile-based authentic audio-visual

materials (AAM) instruction strategy on Japanese EFL vocabulary learning.

Theoretical Framework

According to Multisensory Learning (MSL) Theory, experiencing stimuli through multiple senses (i.e., visual, auditory, sensory-motor) facilitates processing, encoding, retention, and retrieval (Lehmann & Murray, 2005). It is important to note that MSL is not synonymous with Multiple Intelligences Theory, which holds that the optimal learning modality depends on the cognitive disposition of the individual (Gardner, 2011). Rather, MSL theorists contend that because most real-world stimuli penetrate the awareness through multiple senses, humans have evolved to process information through multiple senses simultaneously (Shams & Seitz, 2008). A neuroimaging study revealed that different types of sensory input activate separate regions of the brain (Willis, 2007), indicating multisensory associations enhance unimodal recognition (Kriegstein & Giraud, 2006). Traditional rote memorization of vocabulary elicits visual-reading skills to the exclusion of all other faculties even though lived experiences of vocabulary rarely filter through the single decontextualized modality of a flashcard (Hahn, Foxe, & Molholme, 2014). In short, restricting learning to unisensory input renders learning artificial and less effective.

Literature Review

Authentic Materials

Authentic materials – whether expository, educational, or entertaining – have traditionally been defined as those designed by and for linguistic and cultural natives (Gilsan, 2015; Harmer, 2007; Tomlinson, 2013). Pinner (2016) rejects this definition as outdated, arguing the international character of virtual environments and the profusion of non-native English users mean authentic materials should encompass global voices. Indeed, recent estimates indicate the number of non-native English speakers is roughly double that of native speakers (Eberhard, Simons, & Fennig, 2019). Other scholars have offered more inclusive definitions, which characterize authentic materials as any text or speech developed by real speakers for real (i.e., non-instructional) purposes (Gilmore, 2007; Nunan, 1989; Porter & Roberts, 1981).

Nunan (2001) contends language learners should observe natural speech acts not just to acquire language, itself, but also to understand how social norms within culturally specific contexts govern language use. Cognitive theorists hypothesize that "noticing" morphological, syntactic, and paralinguistic features reinforces vocabulary learning (Gruba, 2006; Wigglesworth, 2001). Gilmore (2011) argues that highly contextualized authentic materials facilitate language learning

and also rescue language from the sterile vacuum of the classroom. This "fun factor" of authentic materials contributes to motivation (Mindog, 2016; Saedi & Ahmadi, 2016), self-efficacy (Noroozi & Mehrdad, 2016), and learner motivation (Jiuhan, 2013).

Empirical studies indicate authentic materials can facilitate vocabulary acquisition. Ghanbari, Esmaili, & Shamsaddini, (2015) divided 66 female EFL students from an Iranian English academy into experimental and control groups to investigate the effects of newspaper articles on vocabulary learning. Independent t-test analysis of Oxford Placement Test results revealed the group which received instruction with authentic readings significantly outperformed the group which received textbook-only instruction. In Japan, Gilmore (2011) exposed the treatment group to a range of authentic materials, including movie clips, news articles, and sound bites, and uncovered similarly significant results. Bal-Gezegin (2014) investigated the difference between authentic video and audio-only groups of Turkish EFL learners' vocabulary knowledge and discovered a significant difference in favor of the video group. Based on thematic analysis of semi-structured interviews, the Bal-Gezegin (2014) echoed Kellerman (1991), concluding that visual representations engaged students while paralinguistic cues, such as gestures and facial expressions, facilitated comprehension.

Several researchers have pointed out logistical, linguistic, and curricular challenges of implementing authentic materials for less proficient language learners (Day & Bamford, 1998; Donna, 2000; Sullivan, 2012). The same factors which make authentic materials beneficial also make them challenging for teachers to adapt for instructional purposes (Guariento & Morley, 2001). Complex grammatical structures, idiomatic language, and low-frequency vocabulary can render content ineffective and even deleterious (Nunan, 2001). Krashen (1989) insists that materials which exceed the learner's *i*+1 or what Vygotsky (1978) termed the Zone of Proximal Development offer no educational benefits and only demotivate learners. A significant challenge for language instructors, therefore, is locating authentic materials that do not exceed the learners' comprehension (Rusmawaty, Atmowardoyo, Hamra, & Noni, 2018).

Thomas (2015) insists authenticity does not necessarily amount to relevance. Students may feel disenfranchised by materials that disregard their home cultures. While authentic materials can provide examples of the target culture's natural language and vital contextual information for developing intercultural competence (Chen, 2012; Vivaldo-Lima, 2008), they can also highlight the cultural and linguistic differences between the students' home cultures. EFL students may relate more with culturally responsive artificial scripts than a genuine artifact from an alien culture (Tamo, 2009). Educators may be able to generate interest and reduce cognitive load by drawing

resources from the local context or catering to the interests of the students (Hadley, 2001; Huessien, 2012).

Authentic Audiovisual Materials

Using authentic audiovisual materials (AAM) for language learning is neither untested nor unsupported. Before the turn of the century, several researchers discovered television news exposure could promote language learning (Baker, 1996; Berber, 1997; Mackenzie, 1997). AAM aids comprehension by targeting multiple senses and linking abstract vocabulary to concrete sounds and imagery within the relevant socio-cultural situation (Ahmed, 2018; Pisarenko & Arsaliev, 2016). Bahrani and Sim (2012) compared the effects of regular AAM exposure on intermediate EFL learners in Iran against informal social interaction on ESL learners in Malaysia and found that AAM was more effective for raising communicative skills than face-to-face conversations. Peters and Webb (2018) discovered that even brief exposure to audio-visual material can spur incidental vocabulary learning.

As with any tool, AAM are not universally effective but, rather, dependent on the task, context, instructor, and learner. Beyond the amount of time teachers must exhaust laboriously scouring the media for applicable, exploitable, and level-appropriate samples, additions to the curriculum are often infeasible (Mehmet, Sule & Seçer, 2016). Even assuming an instructor locates suitable samples and enjoys the curricular freedom and administrative support to implement AAM, many instructors either lack the competence or digital literacy to implement AAM adequately (Park & Son, 2009). Additionally, most AAM exceeds the ability of low-proficiency learners (Mackenzie, 1997), which can lead to boredom, anxiety, and demotivation (Mathew & Alidmat, 2013; Morris, 2011). Mansourzadeh (2014) argues that coupling visual aids with teacher support is more appropriate for less proficient EFL learners.

However, when well-executed, AAM can facilitate language learning (Alluri, 2018; Kalra, 2017; Yue, 2019) and, specifically, vocabulary acquisition (Iranmanesh & Darani, 2018; Ismaili, 2013; Soltani & Soori, 2015). First, in order to capitalize on the multisensory input, the visual and aural input should be congruent (Graddol, 1994; Gunter, 1987). Many news broadcasts, for instance, depict scenes of news coverage with a reporter's voice-over, which effectively reduces the material to audio-only. Bahrani and Sim (2012) argue that AAM with coherent story lines are not only more engaging but also easier for lower-level learners to follow. A further means of avoiding cognitive overload is to limit AAM to short sequences, such as those available on Youtube, instead of entire films (Odone, 2011; Watkins & Wilkins, 2011). Next, because AAM

summon only receptive processing skills, instructors should assign tasks which compel students to interact with the material and one another (Qiang, Hai, & Wolff, 2007). Useful tasks include during-task comprehension and critical thinking questions and post-task position papers and discourse with peers.

Subtitled Audio-Visual Learning

Numerous studies have confirmed that intralingual/bimodal subtitles or captions (L2 speech and text) promote vocabulary acquisition among lower and intermediate learners more effectively than no-subtitles or interlingual/standard subtitles (L2 speech and L1 text) (Bellalem, Neddar, Bouagada, & Djelloul, 2018; Bird & Williams, 2002; Garnier, 2014; Naghizadeh & Darabi, 2015; Peters, Heynen, & Puimège, 2016; Soltani & Soori, 2015; Sydorenko, 2010). Two Iranian studies of interlingual and intralingual subtitling demonstrated that intralingual subtitles bolstered vocabulary recognition, recall (Zarei, 2009), and production (Zarei & Rashvand, 2011). Indeed, a meta-analysis of ten intralingual subtitling studies revealed a large effect size on vocabulary learning (Perez, Noortgate, & Desmet, 2013).

Though subtitles may cause English learners to neglect listening comprehension, intralingual subtitles perform the vital function of addressing spelling and pronunciation variations (Stewart & Pertusa, 2004). Due to a confluence of historical factors – including Germanic, Latin, French, and Greek etymologies, early printing technology, the Great Vowel Shift, and classicist interventions – the English lexis is riven with orthographic peculiarities, such as the following list: **gh**ost, lau**gh**, hi**gh**, b**ea**r, b**ea**t, tr**ea**d, h**ea**rt. Chapman (2017) adds that intralingual subtitles help learners bridge the spelling and pronunciation deviations between nations, such as the American "filet" (fiˈleɪ) versus the British "fillet" (filət). In this sense, subtitles serve as an ongoing didactic aid (Caimi, 2006).

Some researchers have argued that intralingual subtitles are too difficult for language learners to track (Koolstra, Peeters, & Spinhoff, 2002; Yang & Chang, 2014). However, Szarkowska and Gerber-Moron (2018) examined the effect of subtitle speed on comprehension with eye-tracking technology and discovered learners were not only equally capable of processing faster subtitles but were frustrated by slower subtitles. Other researchers claim limiting or even eliminating subtitle use mitigates the split-attention effect (Mayer, Lee, & Peebles, 2014; Mayer & Moreno, 2003), but a study of Chinese EFL learners showed that full captions were no less effective than non-verbatim subtitles for promoting vocabulary acquisition (Hsu, Hwang, Chang, & Chang, 2013). In fact, for EFL learners with more experience reading than listening, subtitles

reduce cognitive load and raise comprehension (Lin, Lee, Wang, & Lin, 2016).

Mobile-Assisted Vocabulary Learning

Though Burston (2011) credits the emergence of Mobile Assisted Language Learning (MALL) to the Portable Digital Assistant, the smartphone, namely the iPhone, and its accompanying applications, have rendered mobile language learning a feasible and, arguably, a superior alternative to Computer Assisted Language Learning (CALL) (Abdollapour & Maleki, 2012). Smart devices enable language learners to escape the temporal and spatial boundaries confining CALL and classroom learning (Gourova, Asenova, & Dulev, 2013). Comparative studies have demonstrated that MALL is more effective for vocabulary learning than traditional paper flashcards (Başoğlu & Akdemir, 2010; Nikoopour & Kazemi, 2014; Pamintuan et al., 2018; Suwantarathip & Orawiwataakul, 2015).

Social media platforms and YouTube, in particular, offer isolated language learners access to authentic examples of the target language (Nejati, 2010). YouTube remains the fastest growing video sharing website in the world, and every month YouTube viewers consume over 60 billion hours of free content. Scholars maintain that YouTube has enormous potential for promoting language acquisition (Alimemaj, 2010; Alhamami, 2013; Alwehaibi, 2015; Bonk, 2008; Terantino, 2011). Despite YouTube's popularity, very few studies have investigated YouTube as a vocabulary instruction tool. The results from one quasi-experimental study revealed YouTube music videos were more useful for raising vocabulary achievement among Malaysian secondary students than traditional teacher instruction (Abidin et al., 2011). Kabooha and Elyas (2018) investigated the effect of YouTube videos on the vocabulary achievement of 100 Iranian female EFL learners. The experimental group received supplemental YouTube video exposure, while the control group received standard instruction. Not only did the experimental group significantly outperform the control group, but 84% of the participants also reported satisfaction with the instruction method.

YouTube's entertainment appeal should not be overlooked. Several studies have demonstrated the positive impact Youtube videos can exert on learner motivation (Chang & Kang, 2013; Joe, 2013; Kim & Chan, 2017). Wang and Chen (2019) contend that students are more likely to hold themselves accountable and engage in self-directed learning because Youtube videos are more enjoyable, flexible, and interactive than traditional classroom materials. Although the researchers concede that YouTube is not suitable for test preparation, Kim, Kim, and Kim (2018) argue that traditional approaches and artificial materials are stressful and demotivating, which

ultimately strains English learning resilience.

Scholars have offered suggestions for maximizing YouTube's pedagogical potential. Unlike other social media platforms, which emphasize synchronous and asynchronous communication between acquaintances, YouTube user behavior is typically receptive or interpretive. While there is a comment section, there is no private messaging function, which means teachers would need to incorporate other platforms or activities in order to facilitate interpersonal communication (Cardoso, 2018). Lee (2017) discovered that quality, not quantity, correlated with vocabulary achievement, which suggests instructors should incorporate a limited number of carefully selected YouTube videos into the curriculum, rather than bombarding students with only moderately useful material.

Selection criteria include alignment with curricular objectives (Zhyrun, 2016), relevance to students (Bahrani & Sim, 2013; King, 2002), demands on language skills (Calder, 2009), congruence of visuals, audio, and text (Cross, 2009; Zabalbeascoa, 2008), clarity of plot line (Stewart, 2006), and presence of paralinguistic features (Gruba, 2006). Additionally, to avoid attention drain, videos should be brief; between 30 seconds to three or four minutes (Talaván & Ávila-Cabrera, 2015; Tomalin, 1991). More crucial for learning are the pre-task, during-task, and post-task activities that engage the students and anchor the content to the curriculum (Salazar & Larenas, 2018).

The literature suggests AAM can be combined with MALL to promote vocabulary learning achievement. Authentic materials serve as real-world models of language use which provide learners with much needed context for vocabulary learning. Meanwhile, videos with intralingual subtitles facilitate comprehension by triggering multiple language processing centers in the brain. However, low-proficiency learners may struggle with natural speech patterns, so interlingual subtitles may be necessary to avoid cognitive overload. Instructors, who lack the competence to implement high-quality, level-appropriate AAM into the curriculum, may do more harm than good, especially considering the time-intensive nature of AAM. Due to its inherent flexibility, MALL may represent a solution to this logistical obstacle. With MALL application, learners gain the time and space to study the content while also benefiting from immediate, explicit feedback. To the authors' knowledge, no study of a mobile-based AAM instructional strategy' effects on vocabulary achievement among Japanese EFL university students has been conducted. The following section delineates how the current study aimed to fill this gap in the literature.

Research Questions

RQ1: What effects, if any, does a mobile-based AAM instructional strategy exert on the vocabulary learning achievement of Japanese EFL university students?

$H1_0$: The mobile-based AAM instructional strategy will exert no significant effect on the vocabulary achievement of Japanese EFL university students.

RQ2: To what extent does vocabulary knowledge predict the effect of the mobile-based AAM instructional strategy?

$H2_0$: Vocabulary knowledge will have no significant moderating effect on the mobile-based AAM instructional strategy.

Method

Participants

This study employed a quasi-experimental pretest-posttest design. Two non-English major English communication classes (n = 68) at a flagship university in southwestern Japan were recruited for this 16-week study in the 2018 fall semester. Participants had six years of experience learning English as a foreign language and ranged from low to high-intermediate. The treatment group (n = 32), which received online AAM vocabulary homework assignments, comprised Environmental Studies majors, and the control group (n = 36), which completed textbook-based vocabulary drills, comprised Engineering majors. Because two students failed to complete either the pretest or posttest correctly, their data were discarded from the study, leaving the treatment group with 31 participants and the control group with 35 participants for a total sample size of 66 participants. All participants possessed smartphone devices. Both groups were taught by the same instructor.

Materials

The integrated language skills textbook, *Scraps* (Cullen & Mulvey, 2008), which emphasizes basic interpersonal communication skills was used as the primary course book. Scrapbook photos accompany each of the eight unit's tasks to facilitate listening and reading comprehension, as well as peer interaction. Additionally, the textbook leverages motor-sensory learning by concluding each unit with a scrapbooking activity. The textbook introduces 240 thematically organized vocabulary words, spread across eight units. The mobile learning application, Kahoot, was used for bi-weekly in-class formative assessments of vocabulary achievement. Communicative skills were assessed with individual scrapbook presentations, followed by small-group discussions.

The G Suite application, Google Forms, was adopted for designing and administering the

treatment group's vocabulary assignments, which consisted of multiple-choice and short-answer vocabulary questions, embedded AAM, and post-task comprehension and critical thinking questions. The embedded AAM were selected from YouTube for their topical relevance, audio-visual-textual congruence, language complexity and speed, and brevity (under four minutes). To diminish the influence of confounding variables related to digital literacy, the researchers decided not to introduce a virtual learning environment. Rather, the instructor submitted printed QR codes, which were linked to the homework assignments, to the treatment group in class. The participants accessed the homework by scanning the QR codes with their mobile devices.

Data Collection Instrument

A researcher-designed, 20-item, multiple-choice and short-answer vocabulary test was employed to gauge vocabulary achievement. Each item was worth one point. To ensure content validity of the instrument, the vocabulary, as well as their meanings and applications, were drawn directly from the course textbook. Three university EFL instructors from a university separate from the research site were consulted to confirm the construct validity of the instrument design and content. Based on their feedback, the researchers modified the distractors on two items. Finally, a pilot test was administered to 95 non-English major students in spring 2018 to confirm the reliability. A split-half test yielded a KR-20 coefficient of .962, indicating acceptably high internal consistency (Fraenkel & Wallen, 1996).

Procedure

The 90-minute classes were held once per week for 16 weeks. During the first class, the groups completed the vocabulary pretest. The instructor provided brief instruction to the treatment group about the mobile learning application, Google Forms. For the remainder of the academic term, both groups received the same in-class instruction, with a particular focus on interpersonal communicative competence. Every two weeks, groups were assigned vocabulary homework in addition to their scrapbook assignment. On Google Forms, the treatment group accessed bi-weekly AAM vocabulary assignments. Each assignment consisted of vocabulary review exercises as well as one or two short authentic videos, which included the target vocabulary. Subsequent video comprehension questions summoned recall and activation of the vocabulary. In the following week, a Kahoot vocabulary quiz was administered to both groups at the beginning of class and followed by scrapbook presentations and discussion. At the end of the term, the vocabulary posttest was administered to both groups.

Results

IBM SPSS version 25 was employed to conduct statistical testing. Descriptive statistics revealed that both groups demonstrated vocabulary learning progress (Table 1). First, assumptions testing was conducted on the data. A Shapiro-Wilk and Levene's test of the pretest scores yielded non-significant results, signifying normality and homogeneity of variances, respectively, and the viability of parametric testing. A one-way ANOVA revealed the groups were not significantly different, and a homogeneity of regression test on pretest-posttest data confirmed ANCOVA assumptions were met. Next, a one-way ANCOVA was performed to examine the relationship between the AAM intervention and vocabulary achievement. The posttest results proved statistically significant ($p < .02$), with a medium effect size ($\eta^2 = .09$) in favor of the treatment group, indicating the intervention exerted a significant positive effect on vocabulary learning (Table 2). Therefore, the null hypothesis of the first research question was rejected.

Table 1
Descriptive Statistics of Achievement and Outcomes

		Pretest			Posttest		
	N	Mean	Std. Dev	Std. Err.	Mean	Std. Dev	Std. Err.
Control	35	6.4571	2.24057	.37873	8.3143	2.58697	.43728
Treatment	31	6.5484	1.87685	.33709	9.7742	2.39039	.42933
Total	66	6.5000	2.06249	.25387	9.0000	2.58397	.31807

Table 2
Control and Treatment Between Groups ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	94.146[a]	2	47.073	8.726	.000	.217
Intercept	216.651	1	216.651	40.161	.000	.389
Pretest	59.109	1	59.109	10.957	.002	.148
Groups	33.025	1	33.025	6.122	.016	.089
Error	339.854	63	5.395			
Total	5780.000	66				
Corrected Total	434.000	65				

To determine the predictive effects of baseline vocabulary knowledge on the intervention, a linear regression analysis was performed on the treatment group's gain scores. The results indicated vocabulary knowledge did not predict vocabulary learning (Table 3). Additionally, an ANCOVA of below-average and above average sub-groups returned non-significant results (Table 4). These findings indicate the baseline performance was unrelated to achievement. Therefore, the null hypothesis of the second research question was not rejected.

Table 3
Baseline Vocabulary Knowledge as Predictor of Vocabulary Achievement

			Unstandardized Coefficients		Standardized Coefficients		
Model		R-squared	B	Std. Error	Beta	t	Sig.
1	(Constant)		5.075	1.626		3.121	.004
	Trt_pre_centered	.046	-.043	.036	-.214	-1.182	.247

Table 4

Below-Average and Above-Average Vocabulary Knowledge ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	32.180[a]	2	16.090	3.236	.054	.188
Intercept	116.751	1	116.751	23.478	.000	.456
Pretest	15.432	1	15.432	3.103	.089	.100
Groups	11.420	1	11.420	2.297	.141	.076
Error	139.239	28	4.973			
Total	3133.000	31				
Corrected Total	171.419	30				

Discussion

This study investigated the effects of a mobile-based AAM instructional strategy on the vocabulary learning of Japanese EFL university students. Based on the significant results of ANCOVA, it can be concluded that the mobile-based AAM instructional strategy promoted vocabulary learning. Further analysis revealed that prior vocabulary knowledge was not correlated with learning achievement.

In terms of general effectiveness, the findings of this study are consistent with other studies investigating the effects of intralingually subtitled authentic videos on vocabulary acquisition (Naghizadeh & Darabi, 2015; Soltani & Soori, 2015; Sydorenko, 2010). The authors surmise that contextually situated vocabulary instruction expanded not only the students' vocabulary size but also their thematic range, which allowed them to intuit how words operate within new semantic patterns. Additionally, this study lends further support for MSL theory, which posits that appealing to multiple senses simultaneously boosts comprehension, processing, and memory retention (Lehmann & Murray, 2005; Shams & Seitz, 2008). As Zanon (2006) insists, subtitling helps learners monitor their comprehension and recognize how vocabulary functions within natural speech. The MALL application allowed learners to access content and receive immediate corrective feedback anytime, anywhere, and as often as required.

The finding that vocabulary knowledge did not predict of the effectiveness of the AAM strategy echoes Perez, Noortgate, and Desmet (2013), whose meta-analysis of captioned video learning studies yielded no correlation between vocabulary proficiency and vocabulary learning. Meanwhile, to the extent which vocabulary correlates with language proficiency (Laufer & Nation, 1999), the finding contradicts arguments that intralingual subtitles distract or cognitively overload language learners (Koolstra, Peeters, & Spinhoff, 2002; Lin, 2006; Mayer, Lee, & Peebles, 2014; Yang & Chang, 2014). As the results of linear regression analysis and sub-groups ANCOVA revealed, baseline vocabulary knowledge was not predictive of vocabulary gains.

Because most Japanese universities, including the research site, organize EFL classes by academic major, language proficiency within a single class can vary considerably. Consequently, EFL instructors must often strike a delicate balance between keeping high-proficiency learners engaged while also ensuring low-proficiency learners satisfy course objectives. The authors attempted to mitigate vocabulary knowledge gaps with MALL, intralingual subtitles, and comprehension tasks, and the results indicate these measures were sufficient. Instructors who intend to incorporate AAM into the curriculum should consider using any or all of these techniques to address problems resulting from baseline differences.

The implications of this study extend beyond vocabulary acquisition. AAM represents, albeit in an abbreviated format, cultural and linguistic immersion (Al Darwish, 2014). Several studies indicate that Japanese EFL learners in full-immersion study abroad programs exhibit learning gains no different from students who remain in domestic classrooms (Cutrone & Author, 2015; Dewey, 2004; Taguchi, 2014). Sánchez-Hernández and Alcón-Soler (2019) found that pragmatic routines and recurrent exposure to pragmatic language was a significant predictor of language achievement. AAM allows learners to decode the relationship between language and context inductively, familiarize themselves with the local register, and mentally prepare themselves for cultural clashes (Godwin-Jones, 2016). Due to the sanitized language that necessarily characterizes classroom study, there is no way to eliminate a study abroad student's learning curve entirely. However, pre-departure exposure to authentic cultural narratives may equip students with the sociolinguistic awareness of language and cultural diversity necessary for assimilation. More generally, because the language demands on study abroad students are analogous to those in EMI programs, AAM should be considered an essential component of all EFL curricula.

Limitations

Limitations, namely, sample size and study length hampered this study. Although the results provide insight into the applicability of mobile-based AAM for vocabulary learning, the authors are reluctant to argue for the generalizability of the findings due to the relatively small sample size (n = 66). A post-hoc power analysis yielded a moderate 0.68. The moderate sample size also explains the decision to couple a linear regression analysis with a sub-groups analysis of covariance. Additionally, the length of the study may have been insufficient for the treatment group to acclimate to the unfamiliar learning strategy. Expanding the sample size, extending the study to a full academic term, and instituting a 2x2 design with high and low achievers is necessary to secure more definitive evidence that AAM promotes vocabulary learning in a Japanese context. Finally, because the authors lacked the resources required for oral communication assessment, a written test was employed. Though reliable and valid, the instrument assessed the participants' vocabulary recognition and recall, rather than production.

Future Research Implications

Despite the limitations of this study, the results contribute to the growing body of Web 2.0 literature. Among this group of Japanese university EFL learners, AAM proved uniformly effective for low and high vocabulary achievers although the moderate effect size suggests other variables, such as affective domain factors, influenced vocabulary learning. Additionally, while the mobile-based AAM strategy leveraged simultaneous content interaction, the linguistically homogeneous environment meant learners had to wait until the following class to apply their learning synchronously.

Future iterations of this study should investigate not only the interpretive aspect of YouTube, but also its productive functions. Language learners may reap linguistic rewards as well as gains in intercultural communicative competence from content generation. Similarly, MALL was exclusively used for individualistic study to avoid the various personal and research-related complications that accompany a virtual learning environment. Those issues notwithstanding, asynchronous online discourse would reduce the time-lag between initial AAM exposure and communicative performance while furnishing an additional learning modality.

Researchers should consider exploring AAM's potential for learning collocations, transitives, and other syntactically marked expressions. Research on study abroad returnees has shown that incidental vocabulary acquisition is insufficient for addressing these linguistic particularities. Pre-departure preparation and study-abroad curriculum may benefit from AAM

inclusion. Additionally, as mentioned above, AAM exposure may accelerate assimilation and facilitate sociolinguistic competence, but further study is needed to determine its effects on study abroad outcomes. Finally, academic English vocabulary proficiency will need to improve drastically before Japanese universities can even consider pursuing MEXT's globalization benchmarks. The uninspiring results from EMI programs in Japan indicate a fundamental shift in how educators approach vocabulary instruction is warranted (Bradford, 2016; Brown, 2016). Future research might, therefore, examine the effect of AAM on more academically rigorous language learning.

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