Cyber Pipeline

Japan-based CALL Research: A Literature Review

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Abstract:

This article reviews the Computer Assisted Language Learning (CALL) literature emerging from Japan published between 2005 and 2008. The aims of this review are to document the technological environment available at various institutions as well as to define the characteristic of the typical Japanese student. What have CALL researchers in Japan reported? Is there any information about Japanese students that would be beneficial to structuring better CALL materials and learning environments? Based on the findings gathered the article then evaluates the quality of the literature to argue that limited evidence is available to develop a general understanding of the average English language learner in Japan and their access to technology.

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Literature on Japan and its affiliation with technology reveals a country slow in taking an interest with such developments (Bachnik, 2003; Gottlieb, 2005). In a report to UNESCO, Yoshida (2003) describes five cases of Information and Communication Technology (ICT) integration in educational settings in which students are actively and creatively using the technology to undertake research projects. Yoshida reveals that the case studies do not clearly describe student-teacher

interaction, the extent to which students can use computers effectively, and whether or not students own technological equipment or borrow it from the school. Reflecting on the comments provided by Bachnik, Gottlieb and Yoshida, it becomes apparent that little in-depth evidence about ICT and education in Japan is accessible. Other research which concerns computer integration in the classroom describing students' use of such technology, and the characteristics of students growing up in these new educational environments is not widely available. This paper hypothesizes that Computer Assisted Language Learning (CALL) researchers are mostly concerned with understanding the possibilities that technology affords language learning. Seldom are they concerned with their participants' abilities. For example Stockwell (2007a) conducts a literature review of CALL articles published in international journals. The outcome of such research leads to an understanding of computer technology, but does not provide any indication about the particular benefits of computer-based learning to a particular group of learners. Japan is a relatively homogenous country and conducting research about students, computers and the interaction between these two variables might provide valuable insights and direction to the academic community.

The objective of this article is to review the literature concerning CALL development in Japan in order to establish a perspective of the current local CALL milieu. It is hoped that such a research objective may provide a better understanding about: 1) what CALL practitioners are researching; 2) the technological environment in which language learning takes place; and 3) who the learners are, and what their abilities, skills and resources are.

This article first explains the research method applied to select the articles for review. It then extracts evidence from the literature about the CALL environment, learning strategies, and Japanese learner characteristics. The third section discusses the findings and provides some suggestions to advance research emerging from Japan.

Literature overview

This research was instigated by the author's need to gain a conceptual framework of recent CALL research conducted in Japan. The Japan Association for Language Teaching (JALT) CALL Special Interest Group (SIG) literature from 2005 to 2008 was collected and reviewed. Out of 58 articles, 36 are from Japan-based researchers. Of the 30 contributions to the JALT Journal, two articles from Japanese researchers focus on a CALL related topic.

Between 2007 and 2008, seven contributions from Japan were published in the CALL journal. The ReCALL Journal only had two contributions from Japan during the same period. In the eight CALICO Journals only two contributions described research based in Japan. The Modern Language Journal published four Japan-based articles, only one of which relates to CALL. The Japan Association for Language Education and Technology has a Japanese based journal which prints one volume per year. At the time of writing, Volume 43 from 2006 was available. Out of ten articles, seven were written in Japanese and three in English. Only the English articles are reviewed.

Amongst the electronic journals available, Language Learning Technology delivered fourteen online journals. Four articles originated from Japan. Another source of online journals is TESL-EJ. Amongst seventeen journals six articles emerging from Japan were retrieved. PacCALL published one online journal per year for 2005 and 2006. There were no publications for 2007 and 2008. Out of nineteen articles gathered, eleven originate from researchers based in Japan.

Literature review – Japan

Seventy-two articles focusing on CALL education in Japan are organized into two categories. The first category, referred to as General

Research, briefly reviews articles which are mainly concerned with reporting on technological development or addressing concerns relevant for all CALL teachers. The second category reviews articles that provide information regarding learning outcomes representative of EFL and CALL education in Japan.

General research

This first category consists of thirty-seven articles written by researchers working in Japan. These researchers are mainly concerned with reporting on technological development or addressing concerns relevant for CALL teachers. O'Dwyer (2006) critiques the epistemological imperfections concerning perceptions of teachers' roles in the classroom. Stewart and Perry (2005) investigate team teaching and content-based learning. Dias (2007) reflects upon the implications of social networking on human connectivity. The article by Heffernan & Wang (2008) is relevant to CALL lecturers as it relates to the issue of copyright laws of multimedia resources. Carney (2006) provides a literature overview of eight articles evidencing telecollaboration in terms of audio-visual and text-based projects. Stockwell (2007a) also conducts a literature review to point out the type of technology being used in the language classroom. A criticism of these articles is that while providing useful information for CALL practitioners the articles are of limited value because the content is too universal and seldom report any educational gains.

Articles that are not reflective of the Japanese educational setting provide limited insights as well. For example, Cummings and Jourdenais (2005) investigate online interaction during a MA-TESOL training program whereby the teacher is located in Japan and the students in California. Similarly, Ohata (2005) reports on the experience of Japanese undergraduates studying in the US and the potential sources

of their anxiety while residing abroad. Fujita (2007) investigates the benefit of email exchanges between English students of Japanese with Japanese students. Stewart and Perry (2005) focus on the implications for establishing a productive team teaching partnership at a Japanese university. Concerning institution specific research, Susser (2005) reports on computer-assisted language teaching of Japanese as a Foreign Language in a teacher training program and Simon-Maeda, Churchill and Cornwell (2006) report on an ethnographic study of their experience as doctoral students at a satellite American institution. Thomas (2005) investigates the benefits of studying at a laptop university, but the article provides little evidence concerning learning outcomes. Although Thomas interviews 254 students, the responses are general such as "100% of respondents said that "laptops had helped them learn better" (p. 83). Thomas is aware that the feedback is broad but provides no indication regarding why laptops could lead to better learning outcomes.

Other articles with a focus on software or online reviews provide limited or no information about learner characteristics. For example, Johnson (2006) reviews "English Trailers v4" (an online learning website), Johnson and Sheehan (2006) review the movie *Shrek,* and Johnson and Hefferman (2006) review the benefits of movie trailers as approaches to enhancing vocabulary acquisition and developing activities which lead to retention. Another software review is the online writing evaluation service "Criterion" (Otoshi, 2005). Campbell (2005a) reviews CALL software resources for the development of phonological awareness. In another article Campbell (2005b) provides a review of various blog services. Tanimura and Utiyama (2006) assess the effect of random versus selected online reading resources and their effect on learner autonomy. Wang, Higgins and Shima (2005) explain the implications behind the design of online English pronunciation training software. However one may question the validity of the conclusion reached by Wang et al. that "this system provides a dynamic, real-time

and interactive way for Japanese English learners to learn and improve their English pronunciation online" (p. 46), since there is no evidence in their article to support it.

In relation to software review, Walker and Kawana (2005) provide a forum review of the Javascript program. Dryden and Dryden (2006) review PowerPoint while Apple and Kikuchi (2007) discuss suitable projects that can be undertaken with this software. Gromik (2006) and Shrosbree (2008) review Windows Movie Maker as a potential learning tool. Shrosbree however assumes that the suggested activities will fit within the Japanese educational context and does not explain some of the challenges that teachers may face when integrating video production in their classroom.

The online learning management system Moodle has been investigated. Baskerville and Robb (2005) review Moodle and the benefits it offers to administer a Business English class. Hinkelman and Grose (2005) report on a university entrance exam carried out with Moodle, and Moloney and Gutierrez (2006) interview twelve university lecturers to assess their knowledge and opinion of Moodle. Robertson (2008), Hunter (2008) and Daniels (2008), investigate the feasibility of integrating Moodle as a Course Management System (CMS) beneficial for EFL CALL teachers. Although they all provide ample evidence about the benefits of Moodle, they also fall short in identifying students' educational gains from using the system. Indeed, a common criticism of all these Moodle research articles is that they seem to be more interested in promoting CMS rather than describing students' language learning outcomes.

Researchers are also focusing attention on podcasting. Unfortunately most of these articles tend to either describe how podcasts are used or discuss students' enjoyment in using podcasts rather than report on learning gains obtained through podcasting. For example, McCarty (2005) explains that this online service fits in with the general Japanese student preference for online anonymity and states that "seven students

have played roles or have presented their own creation in the podcasts" (p. 71), but there is no indication of the learning that ensues from creating podcasts. The podcasting research by Vallance and Shibata (2008) also provides limited evidence of learning gains with their first year graduate students. Their article provides a guideline for integrating podcasting production in the EFL classroom and is more a software review than the report of an experiment. The information is broad and general, for example "*iWriter* allows students to add text and links" (p. 66). This is not an argument or evidence to support the benefit of the outcome of their research. Vallance and Shibata do provide some evidence that their approach is valid when they show an improvement between pre and post text. However, it could be argued that the activity could have achieved similar compelling results without the extensive use of the technology. A more valuable podcasting article would be O'Bryan and Hegelheimer's (2007). These authors provide a clear and succinct experiment that validates the educational gains from integrating iPods in the EFL classroom. They report the educational gain between using audio-based versus video-based content.

Another article which does not provide enough compelling evidence is that of Wang and Higgins (2006). These authors investigate the cell phone habits of thirty-two Japanese students to argue that such technology is not suitable for delivering English lessons. Their research is primarily a technology review, and the evidence that they advance is to argue that the research by Thornton and Houser (2005) is questionable. Yet the research by Thornton and Houser has been widely referred to by the academic community. Unfortunately the majority of these types of articles do not seem to follow the CALICO (n.d.) software evaluation outline which stipulates that teacher and learner fit should be discussed when reviewing electronic learning resources. In fact Gromik's (2005) review of "Costello," a Multi-User Dimension (MUD)-based language learning software appears to be the only article that adheres to the CALICO evaluation outline.

While the literature thus far reviewed is not irrelevant, this article argues that greater emphasis should be placed on reporting student benefits and learning gains through the use of CALL in Japan.

Systematic empirical research

In contrast, the remaining thirty-five articles describe general systematic CALL research. This collection of articles provides the most reflective evidence accessible in Japan about research focuses and methods, task objectives and the participants involved.

Most of the literature examining Computer-Mediated Communication (CMC) is primarily concerned with internet text-based communication. Peterson (2005, 2006) reports on research conducted in the online Avatar-based environment *Active Worlds*. Stockwell (2005) and Bourques (2006) detail an asynchronous experiment between two non-native speaking groups of participants and Kitade (2006, 2008) recounts an asynchronous CMC interaction between a group of native speakers and non-native speakers. Following along similar research, Edasawa and Kabata (2007) conclude that both native and non-native speakers prefer to use indirect correction methods to guide their peers' acquisition of the target language. A novel approach to CMC reported by Thornton and Houser (2005) and Stockwell (2007b) concerns the emergence of mobile phone technology and its effect on language learning and acquisition. Unfortunately these two studies do not provide concurring evidence. Thornton and Houser (2005) state that students enjoyed studying with cell phones, while Stockwell's (2007b) participants preferred to use their home computer to access the vocabulary tutor prototype.

Moving away from internet facilitated communication and more towards individual written expression through the use of online services, Kitao (2005) presents a course overview to describe how

students develop their computer and writing skills by contributing to a class-based webpage publication. Natusch (2005) provides a course review which engages students to read, watch, listen and write about films through online services such as blogs. Pinkman (2005) documents the use of *blogger.com* as a source for empowering Japanese learners to become independent writers, while Fellner and Apple (2006) report the learning outcome of a five-day intensive class to stimulate writing fluency through a class blog. Stapleton (2005) investigates students' critical online research aptitude and its effect on students' final paper-based reports.

Software and online educational services are also receiving attention from Japan-based researchers. Redfield and Campbell (2005) compare the learning outcomes between self-access study and teacher-led lessons to report on the reliability of *Side by Side* as a learning software. Bingham and Larson (2006) review the DynEd software system and its efficiency in improving students' language acquisition. The effect of *PowerWords* on self-study and vocabulary acquisition is investigated by Kawauchi (2006). Nakata (2006) reviews an English language learning computer program's feedback and the degree to which the responses incite learners to retain vocabulary information. The author then follows up on his previous research to compare the effect of vocabulary retention after learners study with lists, cards or computers. Yoshii (2006) researches the correlation effect between pictorial cues and vocabulary retention, in either the first or second language. Another correlation study was conducted by Yamada and Akahori (2007). These authors compare four types of media communication between teachers and students and their effect on the participants' interaction. Loucky (2005) enquires into electronic dictionary usage by Japanese students and provides the outcome of a survey reporting on electronic dictionary functions and whether or not these are of any help to students' language development. In another article, Loucky (2006) reports on categorization in vocabulary learning

strategies to assess how students applied learning strategies to enhance their vocabulary retention.

This category of articles leads to the observation that while much of the literature assesses a variety of macro skills (reading, speaking, listening and writing), greater emphasis is placed on reading and writing. Indeed, very little research has focused on speaking or listening skills. This may be due to the structure of computer technology, such as search engines, and email services or other text-based online services. Levy and Stockwell (2006) clarify that computers are for the most part better suited to expose students to the "teaching of grammar, vocabulary, reading and writing" (p. 178). While Levy and Stockwell state that technological advances limit research of listening and speaking skills, Luoma (2004) explains that assessing oral output is a complex field of research. It could also be argued that reading and writing skills are the easiest to measure and analyze and therefore have received the most attention.

The next part of the article discusses the findings which emerge from these articles to construct a general perception of Japanese learner characteristics and how they affect CALL research projects.

Japan-based CALL research: What we know!

Much of the literature does provide some valuable information concerning Japanese students in terms of their English learning background, where and when they learn and their study preferences.

Hinkelman and Grose, (2005) report that English is a compulsory subject at both junior and senior high schools and that Japanese learners of English receive at least six years of Target Language (TL) exposure (Gromik, 2006; Hirata & Hirata, 2007; Stapleton, 2005). These six years of English education promote writing and reading comprehension skills more than listening and speaking skills (Johnson & Hefferman, 2006),

with a traditional preference towards grammatical aptitude (Yamada & Akahori, 2007). Loucky (2006) finds that most Japanese school students use relatively few language learning strategies to enhance their vocabulary retention, thereby suggesting that they have no effective training. Very few have experience with glossaries (Stanley, 2007). However, missing from the literature is evidence concerning the amount of target language exposure this group of learners receives over the course of a week in the secondary level. As Kawauchi (2006) reports, it is not known how much vocabulary high school students possess upon entering university (p.88). What little information that is available about junior high school students indicates that this group of learners is not accustomed to using technology. This fact is significant as Nakata (2008) explains that such low exposure can affect comparative research outcomes.

Upon entering university participants undertake an extra foundation course before attending classes conducted by non-Japanese teachers (see Kawauchi, 2006). Thus in terms of location, the CALL literature reports on experiments conducted at the tertiary level. In relation to how often students study, unless specifically mentioned, most researchers conducted their experiments during one 90-minute lesson per week over a 13-week (Stockwell, 2007b) or 15-week semester (see Gromik, 2006; Pinkman, 2005; Stanley, 2007; Tanimura & Utiyama, 2006). Participants in the experiment conducted by Mebed (2007) had two 90-minute classes per week. In contrast, Fellner and Apple (2006) conducted a seven-day intensive program, Stockwell's (2005) CMC research was over a five week period, and Edawasa and Kabata's (2007) was over eight weeks due to time constraints caused by Canada and Japan's academic term differences. Kawauchi's (2006) is the only research project conducted over a 20-week period during which the students received two classes per week.

The only research conducted at a Japanese high school is by Nakata (2006, 2008). The remaining research reports on either first

year university learners (Murphy, 2007), second year students (Gromik, 2006; Thornton & Houser, 2005; Yoshii, 2006) or a mix of second, third and fourth year university students (Edasawa & Kabata, 2007; Peterson, 2005; Pinkman, 2005; Stockwell, 2005, 2007b; Tanimura and Utiyama, 2006; Thomas, 2005; Wang & Higgins, 2006; Yamada & Akahori, 2007). Both Loucky (2005) and Susser (2005) conducted research with post-graduate students. Understanding students' technical and language ability is crucial when considering CALL design and development. More research emerging from school environments is necessary.

Regarding study preferences, Johnson and Hefferman (2006) report that non-English majors required to study English as a prerequisite to graduate do not appear to be committed to the learning outcome generated by the course. Kawauchi (2006) states that the success of vocabulary acquisition is dependent on students' initiative to study after class while Redfield and Campbell (2005) make a similar observation when commenting that because the teacher's explanations are similar to the content of the computer-led activity, students either decide to skip the CALL activity or complete the task in Japanese. It would appear that school-based language learning seems to define the cultural perception of in-class language performance. Natusch (2005), comments that Japanese students are infamous for their reticence to participate in communicative activities (p.121). Carney (2006) concurs by observing that Japanese students lack the ability to speak spontaneously, preferring to discuss the matter with their peers prior to responding (see also Gromik, 2006). Carney's overview exposes other Japanese learner specific issues such as students being disinclined towards communicating with foreigners, as they tend to have a negative perception of their English abilities. Also, students feel more comfortable discussing topics that are not confrontational or sensitive, as well as exhibiting a preference towards familiar topics before instigating communication. Students' study preferences are also highlighted by Murphy (2007) who does not elaborate as to why learning in pairs was

beneficial to students and the research outcome. Further research on the effect of team work in the Japanese EFL classroom could illuminate the trend in student learning preferences.

Furthermore, Pinkman (2005), Kawauchi (2006) and Gromik (2006) explain that projects are parts of the syllabus, and that activities completed are assessable. These authors observe that unless CALL projects are graded, students will not complete them (see also Gromik, 2007, and Pagel & Reedy, 2007). Edasawa and Kabata (2007) go as far as stating that "by making participation in the message exchanges mandatory, it is expected that students are more motivated" (p. 191). While this is debatable, one could conclude that even when teachers design projects for the benefit of enhancing students' linguistic exposure and computer skills, students do not seem to want to be involved beyond the required amount of work necessary to receive a credit.

There appears to be a conflict of interest between what students are prepared to do to learn and the work that they should be assessed on. While students comment on the workload that the projects demand (Kawauchi, 2006; Pinkman, 2005), they recognize the benefits of computer-based learning, with activities such as typing, which students claim enhances their vocabulary memorization (Nakata, 2006). Gromik (2006) reports that when students experience repeated exposure to the technology they will become familiar with the software and feel more comfortable talking about technology in the target language (see Stapleton 2005). The use of technology also enhances students' social skills. Edasawa and Kabata (2007) observe that their participants make efforts to negotiate meaning. These authors comment that students recycled new language, indirectly assisted their peers with grammatical or expression errors, took the initiative to include translation to facilitate comprehension and were willing to maintain communication in their own time. They also reveal that miscommunication was the main reason for ending email exchanges prematurely. The inclusion of translation is an interesting research

topic to follow, because it indicates students' learning strategies with text-based communication. For example, Murphy (2007) finds that "students often copy answers to comprehension questions directly from the answer sheet without actually considering why their own answers are different and/or incorrect" (p. 116). The author also observes that once students received feedback, they seldom attempted the exercise again. Further research into the implications of this learning approach might elicit more information about Japanese students' perception about what constitutes good learning and teaching strategies.

Research projects which report that students must complete the CALL task outside the classroom do not inform the readership whether or not students have access to personal or institutional computer resources. For example, although Stockwell (2005) states students were provided with email aliases, online information and resources, it is unclear whether or not students were required to send four to five emails in or outside of class time. Tanimura and Utiyama (2006) compare the effects of random versus related online reading tasks on reading comprehension, whereby the second part of the activity required students to complete the reading outside of class. The authors report that some students commented that they were not familiar with computer technology and the use of the internet. Similarly, Pinkman (2005) explains that blogging projects are completed outside of class time, yet no information is provided as to whether or not students own a computer. No evidence is provided about students' access to hardware nor the trouble they encountered in trying to access the blog if they had a computer.

In relation to technology familiarity, Thornton and Houser (2005) indicate that Japanese students send an average of 200 mobile phone text messages per week (p. 219), but Stockwell (2007b) comments that some of the major reasons for students not wanting to use cell phones as a learning tool are their screen size and cost. His advanced learners preferred to use personal computers instead. Concerning

familiarity with the internet, Hirata and Hirata (2007) state that 7.2 percent of their students had no experience with Japanese commercial search engines. Prichard (2008) concurs by highlighting that while some students were familiar with web searches, "none had experience publishing on public sites with [User-Generated Content] UGC" (p. 32). In addition, some participants do not have an internet connection at home, Mebed (2007) reports. In contrast, Yamada and Akahori (2007) conducted research with highly computer literate participants. The only evidence of technology access is from Thornton and Houser (2005), who revealed that while 17 percent of the student population owned a computer, 100 percent owned a cell phone.

Since the literature provides little concurring evidence regarding students' computer aptitude, further research in student access, familiarity and preference for technology-based communication, and experience with technology would provide necessary data for future development of CALL in Japan. The Japan-based articles do affirm that students appreciate and enjoy CALL activities. Nonetheless, the evidence gathered from this review indicates that much is assumed about students' abilities, little is known about students' access and/or ownership of technological devices and research projects are structured more along the researcher's interests rather than on developing students' skills.

Discussion

With regards to the content provided in the literature, this article concurs with Carney's (2006) observation that "how the data was reported and analyzed is of significant concern" (p. 44). The discussion offers three areas that Japan-based researchers might want to consider in future research. These are the implications of findings upon learner outcomes, research reliability and novelty of activity.

Learning outcomes

Johnson and Hefferman (2006) state that "by arming students with learning strategies," the project constructed an enjoyable learning experience (p.74). Their article does not provide any visible evidence to document how awareness of learning strategies was shared with the students. Hinkelman and Grose (2005) utilize a Moodle quiz as a university entrance exam assessment tool without evaluating the reliability of the test items. Their conclusion reveals that "24 of the 50 test items were marked for revision" (p.77). Even more concerning is that those students were accepted into the English program. Similarly Hirata and Hirata (2007) report students' positive experiences, but they do not deal with the accuracy of student created collocations. These students pass the course with a perceived impression that something is wrong with the collocations they have investigated. The authors do not seem perturbed by this acknowledgment. In relation to measuring language development progress, Stockwell (2005) undertook to evaluate the lexical gain of Japanese students but he does not apply a pre and post test method to certify the validity of his conclusion. Neither Edasawa and Kabata (2007) nor Pinkman (2005) conduct a pre and post-test. Pinkman (2005) does not indicate how the 150-word weekly assignments were rated. Gromik (2006) also does not report how film performances were rated and what information could be deduced from the evidence gathered. Redfield and Campbell's (2005) comparative study between self-access and hybrid computer and teacher-led learning, offers no clear indication as to the language learning development students gained from the learning activity. There is no indication about communicative outcomes to justify why CALL learning software was perceived as the best teaching and learning approach. The inability to justify CALL-based learning outcomes is also prevalent in Pagel and Reedy's (2007) study. These authors report on an expensive longitudinal CALL investment, but provide no evidence

concluding that students' progress was worth the investment. Although Murphy (2007) provides some indication that students did benefit from the Knowledge Correction Response feedback, the reliability of their findings is questionable since they conducted a one-shot research project. The lack of linguistic outcome is also noticeable from Natusch's (2005) research. Thus, as Chapelle (1997) explains, when investigating CALL application, researchers must take into consideration the language learning outcomes generated from their research.

Research reliability

Research reliability is not about replicating the findings but about increasing the reliability of an argument or teaching approach (Yin, 2003; p. 37). Observations from the literature reviewed indicate that very little research attempts to replicate previous studies conducted in Japan. This is important especially if the data advanced to the Japan-based research community is to offer valid and reliable evidence (Cresswell, 2008). For example Shrosbree (2008) offers some suggestions for integrating video production in the language classroom. The article does not acknowledge that video production in Japan was first reported by Ryan in 2003. Shrosbree's article falls short of offering an extensive literature review to justify the benefits of integrating video production in the EFL curriculum.

In contrast both Prichard (2008) and Kikuchi and Otsuka (2008) refer to previous literature to explain the need to further investigate the applicability of blogs in the CALL-EFL context. While both articles refer to the positive reflections Pinkman (2005) and Fellner and Apple (2006) have about blogging, they do not challenge any of the "deficiencies in past literature" (Cresswell, 2008; p. 106). Put another way, neither Prichard nor Kikuchi and Otsuka take into account the limitations which emerged during Pinkman's and Fellner and Apple's research. Pinkman's research limitations can be summarized as follows: First after

completing an exposure lesson on blogging, students were required to continue the activity outside of class (p. 15). No evidence reports on students' outside of class performance. Such evidence would reveal invaluable information concerning some of the difficulties experienced by students; for example, problems with uploading pictures (p. 17). Pinkman also reports that students perceived their writing to improve but she does not evaluate any of the students' written work. Therefore any claim to writing improvement is questionable. Another problem, although not necessarily a limitation, is that Pinkman acknowledges that in the pre-test participants stated that they wanted to communicate verbally with their teacher and peers. Yet her research interest leads her towards a writing task. One may legitimately wonder if Pinkman's findings would have been the same if her students had been more interested in writing. Fellner and Apple (2006), on the other hand, provide ample evidence to illustrate that their students improved their writing skills through blogging. However, vocabulary retention is not mentioned by these authors. Certainly retention is important in any vocabulary development and a delayed post-test is a most suitable research approach to evaluate students' retention (Lu, 2008). In spite of Fellner and Apple's impressive finding that a "350% increase in the number of words used in students' blog entries" was observed, it is currently of limited value because the study and subsequently their results have not been replicated, nor was vocabulary retention investigated. The authors did however, point out that the brevity of the seven-day project is a limitation and that research over a longer period of time would provide a better perception of students' writing development (p.24). In short, regardless of how promising findings such as these are, they must be validated before being accepted as "fait accompli". Further studies in this area are needed to shine some light upon Japanese students' ability to acquire and retain vocabulary either "incidentally" through the engagement in an activity or "intentionally" due to the testing requirement (Hulstijn, 2001; p. 266).

The limitations mentioned above do not make these authors' findings irrelevant. Far from it, as the research represents an important and valuable step in understanding the effectiveness of CALL in Japan. However, if Japan-based researchers are to offer any compelling arguments of benefit to the CALL community in particular and the language teaching community in general, replicating previous findings would improve their reliability. Furthermore, constructing more systematic research that aims to provide as much evidence as possible in the form of pre, post, and delayed tests would validate and expand upon the findings and educational benefits of CALL approaches undertaken in Japanese educational environments.

Novelty of activity

Research findings from the literature state that students enjoyed the various CALL activities they were engaged in. Since the literature reports on one-shot experiments, it is possible to challenge the validity of this argument on three counts. First, the researcher is in most cases the grade provider. Second, the researcher has a final decision over students' grades, these participants are likely to supply the type of information that they believe the researcher/teacher wishes to read or hear. Third, as Nakata (2008) hypothesizes, "it is possible that the PC group evaluated computers favorably just because they were new to them" (p. 17). This issue is seldom investigated in research conducted in Japan.

Limitations

With nearly every academic study there are limitations and this literature review is no exception. The review could have been more

comprehensive by including articles in languages other than English and by expanding the collection to internal-institution publications and conference papers. Also, only CALL-specific articles are reviewed. Further research might attempt to review a wider collection of articles to merge Second Language Acquisition research with CALL in Japan. For example, Nakatani (2005) reviews language learning competence to investigate awareness-raising of oral communication. Extending on this research, Nakatani (2006) then explains the implications for "developing an oral communication strategy inventory" (p. 1) and then assesses the validity of this inventory (see also Yabukoshi & Takeuchi, 2006). Such research would provide invaluable documentation for CALL researchers interested in vocabulary acquisition from a Japan-based perspective.

Conclusion

This article reviewed the literature emerging from Japan with a specific focus on CALL. The first section of the article categorized research, which although valuable, provides little evidence concerning students' linguistic gains. The second section summarized evidence which document Japanese students' participation in the CALL classroom. The outcome of this literature review revealed several important findings. First, CALL research in Japan is scattered over a wide range of technological use, software integration and computer-based activities but there is little known beyond a general understanding about Japanese students, their abilities and skills and their access to technology. In addition, while a number of studies have reported significant gains through the use of CALL, little research has focused on replicating these claims. Finally, to provide greater relevance to CALL practitioners, researchers should try to attain a greater understanding of their students' background. This would allow for the development

of teaching methods better suited for the Japanese educational and cultural reality. While CALL in Japan is in the care of a strong group of researchers, there is much ground to cover before a true and accurate understanding of what benefits Japanese learners and instructors can emerge.

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