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Article

How Do Stakeholder Groups' Views Vary on Technology in Language Learning?[1]

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Abstract

This study examines how technology is perceived by different stakeholder groups in The Language Flagship programs.[2] We administered questionnaires to three stakeholder groups: 14 directors, 34 instructors, and 100 learners at a variety of institutions with three goals: (a) to investigate what technologies the directors, instructors, and learners find useful for language instruction; (b) to explore how and to what degree the perceptions of the directors, instructors, and learners agree about technologies they use; and (c) to study how learners' views vary with regard to the value of various technologies for language learning inside and outside the classroom.

KEYWORDS: TECHNOLOGY USE, STAKEHOLDER VIEWS, SURVEY, RELIABILITY, LANGUAGE FLAGSHIP PROGRAMS

Introduction

The use of technology in second language programs has been widely documented over an extensive history dating back almost fifty years (see Bax, 2003; Butler-Pascoe, 2011). During this time, much has been said about the potential of computer-assisted language learning (CALL) tools available for language teachers, students, and programs. For example, previous studies have looked at introducing new tools (see Burston, 2014b; Garret, 2009; Zhao,

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2003), the effects of integrating technology into L2 learning environments (see Banados, 2006; Warschauer, 1995), and computer-based and computer-adaptive language testing (Brown, 2016; Chapelle, 2008; Winke & Fei, 2008).

Relatively less has been said, however, about the perception of CALL from the perspectives of the stakeholders involved in its use. Some researchers have explored the views of students or teachers individually (Ayres, 2002; Bordbar, 2010; Lee, 2000), though there have been few attempts to compare stakeholders regarding the use of technology in L2 learning contexts. Furthermore, for as much as has been written about the successes of CALL, there remains little discussion about what technologies are actually being used by programs and how they are being applied. The goal of this project was to examine these questions in the hope of raising awareness for stakeholders interested in integrating CALL into their programs.

Areas of Research in CALL

As the availability, uses, and potentials of technology have grown over the years, so has the field expanded to look beyond the tools themselves to their applications and implications in L2 classrooms. More recently, research has looked at the use of adaptive technologies for language learning (Amaral & Meurers, 2011; Stockwell, 2007), computer automated corrective feedback (e.g., Heift & Schulze, 2003), and corpus-tools (e.g., Lee, Lee, & Sert, 2015; Meunier, 2016; Warren, 2016). Scholars have also begun to grapple with the complexity of integrating technology into language learning in terms of (a) learner input (Vajjala & Meurers, 2014), (b) learner output and variability (Amaral, Meurers, & Ziai, 2011), and (c) pedagogical tasks (Quixal & Meurers, 2016). Important steps have also been taken in the development of automated writing evaluation (e.g., Hegelheimer, Dursun, & Li, 2016; Liao, 2015). In most of these contexts, technology is discussed in terms of its wide-reaching and flexible potential for language learning, but what about the uses of different technologies?

Uses of Technology in CALL

Information about what technology stakeholders are utilizing in actual practice has not been explored to a large degree in the field of CALL. Although language learners' perceptions of various types of technologies have been addressed (e.g., Kim, Rueckert, Kim, & Seo, 2013; Lin, Warschauer, & Blake, 2016; Pardo-Ballester, 2012), differences in perceptions according to the context of use have not been similarly explored. A cursory examination of recent publications on CALL reveals a variety of uses that are possible, including (a) blogging (e.g., King, 2015; Li & Zhu, 2013), (b) course-management tools (e.g., Tsai, 2015; Tsai & Talley, 2014), (c) online gaming (e.g., Bytheway, 2015;

Cornillie & Desmet, 2016; Godwin-Jones, 2014), (d) social networking and messaging (e.g., Jin, 2015; Wang & Camilla, 2014), (e) synchronous audio/video interaction (e.g., Payne & Whitney, 2013; Sykes, 2013), and (f) web-based teaching (e.g., Lee, Cheung, Wong, & Lee, 2013; Zhao, 1996). Furthermore, one popular and continually growing area of development is on the use of mobile-based technologies, including the use of devices (e.g., Amer, 2014; Burston, 2014a; Hwang & Chen, 2013; Stockwell, 2016) and applications (e.g., Chen, 2013; Ducate & Lomicka, 2013; Lai, Shum, & Tian, 2016). Yet despite this, much of that work is focused on current or future developments and innovations. What appears to be missing is information about the degree to which stakeholders within language programs are familiar with their options, how able they are to access those options, and how they view those options in terms of usefulness inside or outside of the classroom for language learning purposes.

In addition, much of CALL research remains focused on teachers and learners of *English*. Resources available for other languages, which often present a very different set of linguistic challenges and needs, are often ignored. This situation seems to be shifting with recent articles about using technology for learners of Chinese (e.g., Tseng, Lien, & Chen, 2016; Zhang, 2014), French (e.g., Liakin, Cardoso, & Liakina, 2015), Japanese (e.g., Hitosugi, Schmidt, & Hayashi, 2014; Nagata, 2013), Korean (e.g., Cowan, Choo, & Lee, 2014), Portuguese (e.g., Melo-Pfeifer, 2015), and Spanish (e.g., de la Fuente, 2014; Sykes, 2013). However, research in this area remains limited.

The purpose of this project, then, is to explore views on technology by different stakeholders within non-English language contexts. To this end, this article addresses the following questions:

1. What technologies do directors, instructors, and learners use in language classrooms?
2. To what degree do directors, instructors, and learners compare in terms of the technologies they use?
3. Are learners' perceptions of the usefulness of technology the same for applications inside and outside of class?

Method

Participants

Data for this study came from a larger study on technology use and perceptions from stakeholders in The Language Flagship program, a foreign language intensive program implemented in 2006 across 27 universities in the United States aimed at helping learners achieve professional-level proficiency in one of nine languages. For more information about the program, see

https://thelanguageflagship.org/. The current study looked at a subset of quantitative data taken from questionnaires distributed to *program directors* (n = 14), *instructors* (n = 34), and *learners* (n = 100) within The Language Flagship. Further data, including qualitative responses to open-ended questions on the surveys, were also gathered, but are not reported here (see Brown, Trace, & Rodriguez, 2016).

Beginning with the fourteen directors, eight reported having experience teaching Chinese, two Russian, and one each for Swahili, Turkish, Hindi, and Korean with 22.50 years of teaching experience on average. One had 5.00 years of experience teaching fully online courses and six had an average of 5.50 years of teaching hybrid online courses. All 14 self-rated their familiarity using instructional technology on a four-point scale (with 1 = very unfamiliar to 4 = very familiar) to be 2.93 (SD = 0.80) on average.

The 34 instructors were teachers of Arabic (5), Chinese (15), Korean (7), Russian (4), Swahili (2), and Turkish (2), with 9.40 years of teaching experience on average. Seven had taught an average of 0.89 years of fully online courses, while 16 had taught an average of 2.10 years of hybrid courses. All 34 rated their familiarity with technology to be 2.91 on average (SD = 0.74).

Lastly, the 100 learners surveyed were 21.60 years old on average (SD = 5.04) and ranged from 17 to 58 years. There were 45 females, 49 males, and 6 without answers. In terms of academic status, they were overwhelmingly undergraduates (95), with 5 not specifying. Students rated their familiarity with technology to be 2.74 on average (SD = 0.89).

Materials

Data were collected for stakeholder groups using questionnaires, which were developed separately for each group. The questionnaires were designed by two second language survey research specialists based on specifications provided by language center and Flagship program stakeholders. The questionnaires were then revised collaboratively in two rounds based on feedback from center and program staff, who helped revise questions to specifically target features of the program that stakeholders would be familiar with. Each contained the following sections: (a) Likert items about technology-based teaching and learning tools use, (b) open-ended items about the challenges and availability of technology, and (c) demographic questions. Each questionnaire also had unique sections tailored for the specific populations involved. Directors were asked about collaboration with other institutions and about technology use during the learners' final year abroad. Instructors were also asked about the use of technology during the final year, while learners were asked separately about the usefulness of technology inside classrooms and their use of technology outside class. Likert items were based upon a three-point scale.[3]

The final questionnaires were administered as follows: emails were sent including (a) cover letters describing the study, (b) a URL link to the appropriate questionnaire, and (c) details about informed consent. Different messages were sent to Flagship directors, who were also asked to forward separate cover letters, URLs, and informed consent information to Flagship instructors and learners within their organizations. The questionnaires are available in pdf format at http://lftic.lll.hawaii.edu/?page_id=1618; where the questionnaires are located in Appendices G (for Flagship directors), H (for Flagship instructors), and I (for Flagship students).

Results

We first examined the reliability of our quantitative results on the various questionnaires and subparts by calculating Cronbach alpha internal-consistency reliability estimates, as shown in Table 1. Because the magnitude of alpha (which can range from .00 for a completely unreliable instrument to 1.00 for a completely reliable one) is related to the number of items involved, we also report the numbers of items in each case. Notice in Table 1 that the alpha reliability estimates ranged from .76 to .95, which means that the percentage of reliable variance accounted for in the results of these questionnaires ranged from 76% to 95%.

Table 1
Cronbach Alpha Reliability Estimates for Questionnaires and Applicable Subparts

Group	Items	Cronbach Alpha	Number of Items
Directors	Q01–Q18	.76	18
Instructors	Q01–Q18	.79	18
Learners	RWLS Self-Ratings	.95	4
Learners	IC01–IC18	.86	18
Learners	OC20–OC35	.85	16
Learners	IC & OC Items	.91	34

We next examined the means of the Likert item results to determine the degree to which the responses of directors, instructors, and learners for the use of various technologies compared. Table 2 summarizes the means for usage for 18 technologies for the three groups. The first column provides a brief descriptor for each of the technologies (see Appendix A for the wording of the original items). The other six columns show the means (*M*) and standard deviations (*SD*) for the responses of each group presented in the order in which they appeared on the questionnaires.

Table 2 indicates that, on a scale of 1 to 3, the means for all three groups for course managers, online resources, general websites, language websites, and vocabulary tools were above 2.00; that directors and learners (but not instructors) rated A/V conferencing above 2.00; that only directors rated media editing above 2.00; and that only learners rated class websites above 2.00. Everything else was below 1.99.

Notice also that the means in Table 2 have decreasing ranges from 1.14 to 2.93 for directors, 1.27 to 2.68 for instructors, and 1.53 to 2.51 for learners, and that the standard deviations have similarly decreasing ranges from .27 to .80 for directors, .42 to .87 for instructors, and .58 to .69 for learners. This suggests that the opinions of directors, then instructors, and learners are increasingly homogeneous.

Table 2
Views on Usage of Technologies for Directors (*n* =14), Instructors (*n* = 34), Learners (*n* = 100) Inside Class

	Directors		**Instructors**		**Learners**	
Brief Item Description	*M*	*SD*	*M*	*SD*	*M*	*SD*
Course Managers	2.64	.63	2.68	.53	2.45	.61
Class Websites	1.43	.76	1.91	.87	2.19	.65
Online Resources	2.86	.36	2.68	.47	2.50	.58
A/V Conferencing	2.14	.66	1.77	.70	2.09	.60
Chat/Messaging	1.43	.51	1.53	.61	1.88	.62
Discussion Boards	1.50	.52	1.65	.65	1.78	.60
Corpus Resources	1.50	.65	1.62	.65	1.69	.63
Blogs	1.57	.65	1.41	.50	1.82	.59
Social Networking	1.79	.80	1.79	.64	1.99	.66
General Websites	2.93	.27	2.68	.53	2.36	.59
Language Websites	2.27	.73	2.15	.66	2.30	.67
Language Exchanges	1.36	.50	1.27	.45	1.89	.62
Language Software	1.43	.51	1.24	.43	1.70	.69
Mobile Apps	1.43	.51	1.47	.56	2.00	.65
Role-Play Games	1.14	.36	1.27	.45	1.53	.64
Vocabulary Tools	2.21	.58	2.15	.61	2.51	.58
Assessment Tools	1.79	.70	1.71	.58	1.97	.58
Media Editing	2.07	.73	1.97	.63	1.70	.64

Table 3 shows the results for a repeated-measures analysis of variance (ANOVA) for the three groups and responses across the 18 technologies.

Because two ANOVA procedures were performed in this study, a Bonferroni adjustment was used to divide the experiment-wise alpha of .01 across the two analyses, which means that the *p* values shown in Table 3 can only be considered significant if they are below the .005 level (.01/2 = .005).[4] Notice that the main effect for groups is not significant, but that the one for technologies is ($p < .005$), as is the group by technologies interaction. Note also that the power statistics are all above .80 indicating sufficient power in this analysis to detect differences if indeed they exist. In addition, the partial eta^2 values indicate that 6.8% of the between-subjects variance can be attributed to differences among groups, while 25.7% of the within-subjects variance is due to differences among the technologies, and 6.8% to the interaction of groups and technologies.

Table 3
Repeated-Measures ANOVA for Three Groups Responses Across 18 Technologies

Source	*SS*	*df*	*MS*	*F*	*P*	**Partial Eta^2**	**Power**
Between Subjects							
Groups	19.418	2	9.709	5.250	NS*	.068	.827
Error (Between Subjects)	268.166	145	1.849				
Within Subjects							
Technologies	246.967	17	14.527	50.030	< .005	.257	1.000
Group by Technologies	52.439	34	1.542	5.311	< .005	.068	1.000
Error (Within Subjects)	715.782	2465	.290				

*Not significant at $p < .005$ comparison-wise (i.e., $p < .01$ experiment-wise)

Figure 1 illustrates the interactions. Each of the lines in Figure 1 represents one of the groups (with a solid line for directors, a large-dash line for instructors, and a small-dash line for learners). The 18 technologies are labeled across the bottom, and the various levels of means (from 1.0 to 3.0) are labeled on the left. This sort of graph makes it easy to see which technologies were rated high and low in terms of usage, which technologies the groups varied most on, and where the lines cross (i.e., interact). The variations between groups were not significant and so should be taken to be due to chance; the variations among technologies, however, were significant; and the crossing of lines explains (a) why the interaction effect was significant and (b) where the groups changed places in terms of giving the highest, middle, or lowest mean responses. Specifically, learners rated course managers, online resources, general websites, and media editing lower for usage than directors and instructors, while they

assigned higher ratings for the other technologies than directors and instructors did. Note that, in general, the learners tended to respond with the highest responses for the usage of other technologies and that the directors and instructors tended to perceive these as less used.

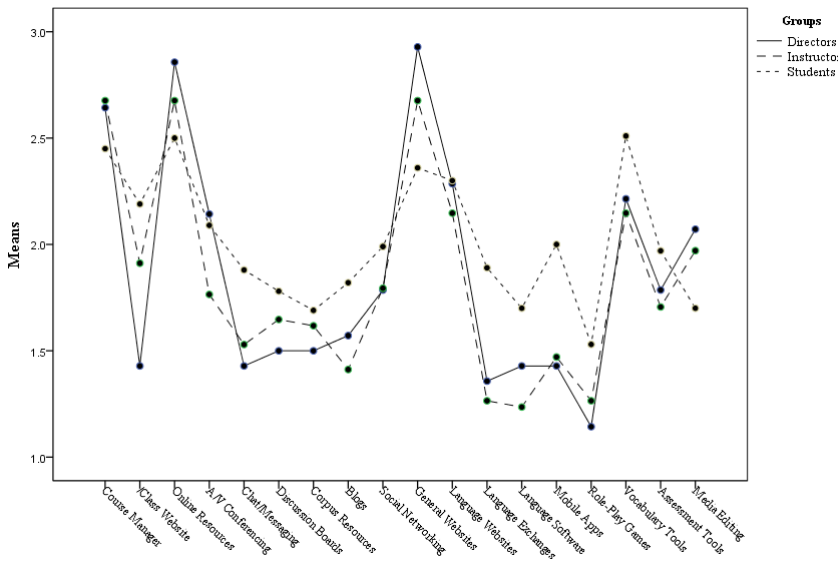

Figure 1. Usage of various technologies for language learning inside class.

The differences in means discussed above are interesting, but we also wanted to look at the correlations between the mean responses in different pairings of directors, instructors, and learners (both inside and outside class), as shown in Table 4. Note that there are four 1.00s placed diagonally across the table, which represent the correlations of each set of mean responses with itself. Below these are the *correlation coefficients* for the four sets of mean responses. The asterisks indicate that all of these correlation coefficients are significant at $p < .001$, which means that there is only one-tenth of one percent probability that such correlations were found by chance alone.

The top-left half of the table displays the *coefficients of determination*, which represent the proportion of overlapping variance between pairings of mean responses. For example, the coefficient of determination of .88 indicates that 88% of the variation in the directors and instructors mean responses was overlapping. Clearly then, the mean responses assigned by directors and instructors were very similar in how they varied. At the same time, both the directors and instructors agreed less with the learners' responses for inside and outside the classroom (ranging from 63% to 70%) than with each other at 88%. Notice

Table 4
Correlations and Coefficients of Determination on Use of Technologies by Directors, Instructors, Learners Inside and Outside Class

Group	Directors	Instructors	Learners' Usefulness Inside Class	Learners' Use Outside Class
Directors	**1.00**	.88	.63	.66
Instructors	.94*	**1.00**	.70	.68
Learners' Usefulness Inside Class	.80*	.84*	**1.00**	.86
Learners' Use Outside Class	.81*	.83*	.93*	**1.00**

*$p < .001$

also that the coefficient of determination is .86 for the responses assigned by the learners for inside-class usefulness and outside class use, which indicates that 86% of the variance between these responses was overlapping. Therefore, the learners were rather self-consistent in these two sets of responses. However, there were some interesting mean differences in their responses for usefulness inside and use outside the classroom.

Table 5 summarizes the means for the 15 technologies that were common to the inside and outside class portions of the learner questionnaires. The first column provides a brief descriptor for each of the technologies (see Appendix A). The other four columns show the means and standard deviations for the responses of the learners about *how **useful** the technologies were inside class* and about *how **often** they used the technologies outside of class*. They are presented here in the order in which they appeared on the questionnaires.

Table 5 indicates that, on a scale of 1 to 3, the learners rated A/V conferencing, general websites, language websites, mobile apps, and vocabulary tools above 2.00 for being useful inside class, but only general websites and vocabulary tools were rated above 2.00 for being both useful inside class and something they use outside of class. Everything else was 1.99 or lower on average. Notice also that the means range from 1.53 to 2.51 for inside-class usefulness and from 1.20 to 2.46 for outside-class use, while the standard deviations range from .58 to .69 for inside-class usefulness and from .49 to .77 for outside-class use.

Table 6 shows the results for a doubly repeated-measures ANOVA for inside/outside responses and responses across the 15 technologies that were common to both sets of inside-class usefulness and outside-class use items. Notice that the main effects for inside/outside and technologies are both significant (p) at < .005, as is the inside/outside by technologies interaction. The power statistics are all at 1.00 indicating the highest possible degree of statistical power. In addition, the partial eta^2 values indicate that inside/outside accounts for 55.8% of the variance in that variable and associated error, while technologies accounts for 35.4% of the variance in that variable and associated

Table 5
Views on Use of Technologies for Learners Inside and Outside of Class

	How Useful Inside Class		How Often Used Outside Class	
Brief Item Description	*M*	*SD*	*M*	*SD*
A/V Conferencing	2.09	.60	1.70	.72
Chat/Messaging	1.88	.62	1.64	.77
Discussion Boards	1.78	.60	1.32	.57
Corpus Resources	1.69	.63	1.28	.55
Blogs	1.82	.59	1.40	.65
Social Networking	1.99	.66	1.95	.69
General Websites	2.36	.59	2.46	.63
Language Websites	2.30	.67	1.83	.77
Language Exchanges	1.89	.62	1.31	.60
Language Software	1.70	.69	1.28	.49
Mobile Apps	2.00	.65	1.71	.73
Role-Play Games	1.53	.64	1.20	.49
Vocabulary Tools	2.51	.58	2.46	.73
Assessment Tools	1.97	.58	1.67	.70
Media Editing	1.70	.64	1.37	.63

error, and the interaction of the two accounts for 8.1% of the variance in that interaction and associated error.

Table 6
Doubly Repeated-Measures ANOVA for Inside/Outside Responses Across 15 Technologies

Source	*SS*	*df*	*MS*	*F*	*p*	**Partial Eta²**	**Power**
Inside/Outside	71.46	1	71.46	125.04	< .005	.558	1.00
Error (Inside/Outside)	56.58	99	.57				
Technologies	309.43	14	22.10	54.24	< .005	.354	1.00
Error (Technologies)	564.77	1386	.41				
Inside/Outside by Technologies	23.82	14	1.70	8.71	< .005	.081	1.00
Error (Inside/Outside by Items)	270.648	1386	.20				

Figure 2 shows the interaction of inside-class usefulness and outside-class use (with large dashes for the one and small dashes for the other, respectively). The

variations between the lines illustrate why the main effect for inside/outside was significant; the variations across technologies show why the main effect for technologies was significant; and the crossing of lines (at general websites) explains (a) why the interaction effect was significant and (b) where the inside/outside changed places in terms of having the highest or lowest mean responses. For example, inside-class usefulness responses are consistently higher than those for outside-class use, except for general websites and vocabulary tools, which probably indicates that the learners find many of these technologies useful in class, but are less likely to use them for language learning outside of class (with the clear exceptions of general websites and vocabulary tools).

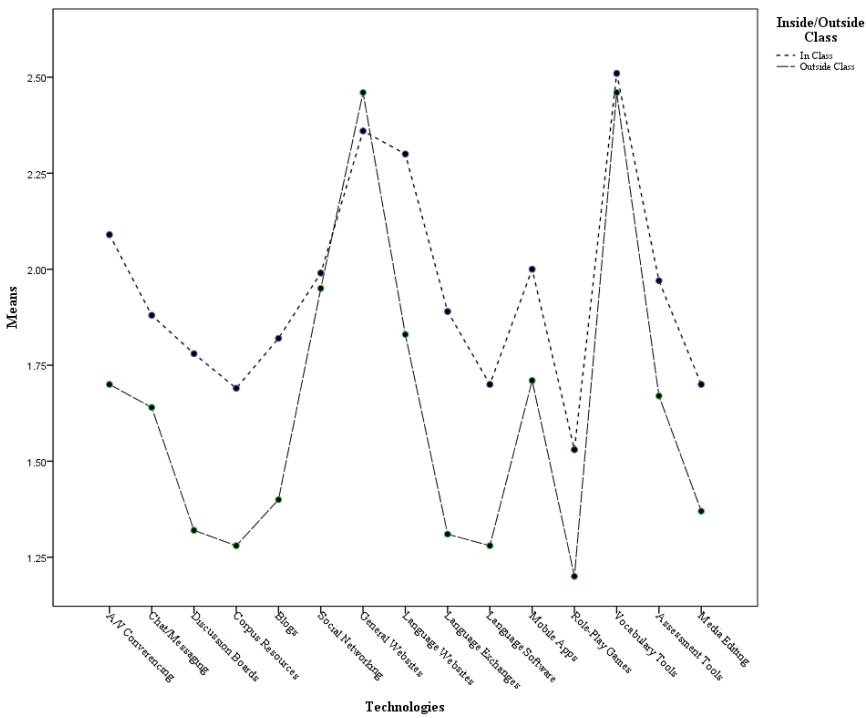

Figure 2. Learner responses for various technologies for inside-class usefulness and outside-class use.

Discussion

1. What Technologies Do the Directors, Instructors, and Learners Use in Language Classrooms?

Tables 2 and 3 and Figure 1 show that all three groups frequently used course managers, online resources, general websites, language websites, and vocabulary tools, all of which can be regarded as common technology tools found

in language classrooms. In comparison to other tools, like blogs, role-playing games, or corpus-based resources, the above technologies are the sort that tend to be well known by multiple stakeholders, and thus it should not be surprising that they were identified as frequently used.

The significant interaction effect between technology use and groups, however, is curious and explained by the fact that the learners rated their usage of technologies more consistently higher than other stakeholders, with the exception of course managers, online resources, general websites, and media editing tools. One interpretation of this is that learners are familiar with a broader scope of technologies than other stakeholders. Brown et al. (2016) found that directors and instructors often provided non-specific answers when asked about the kinds of technology available to support language learning (e.g., "we need to develop technology based instruction materials that make foreign language learning more engaging," "I'd like more information on what's being used in other institutions"), while students tended to list out specific technologies, websites, and applications (e.g., "more use of websites like WeChat, Groupme, and FluentU, as well as programs like Skritter, Anki, Quizlet, and Pleco"). It could be that as students are better versed in alternative forms of technology, they also are more likely to spread their use of technology across more platforms as compared to directors and instructors, who are more constrained in their choices.

2. To What Degree Do the Directors, Instructors, and Learners Compare in Terms of the Technologies they Use?

The correlation data indicated (a) that the mean responses assigned by directors and instructors were very similar in how they were ordered and (b) that both the directors and instructors agreed less with the learners' responses (ranging from 63% to 70%) than they did with each other (88%). The coefficient of determination for the responses of the learners for inside- and outside-classroom technology indicated that 86% of the variance was shared, which (as noted above) further indicated that the learners were relatively self-consistent in these responses.

3. Are Learners' Perceptions of the Usefulness of Technology the Same for Applications Inside and Outside of Class?

Tables 5 and 6 and Figure 2 revealed that while the learners found certain technologies useful inside class (i.e., A/V conferencing, general websites, language websites, mobile apps, and vocabulary tools), only general websites and vocabulary tools were rated highly for use outside of class. Other technologies that were rated as less useful in class showed a similar drop-off when in relation to their usage outside of class. The overall trend seemed to indicate that

technologies that students find useful in class are more likely to be used outside of class, but in this particular context the extent of those technologies remains limited. Chen and Cheng (2008) found that pedagogical practices can affect language learners' perceptions of the effectiveness of technological tools, so it might be that, despite students having more knowledge of technology options, their exposure to these tools in the learning environment of the classroom is limited and so there is little impetus to use different forms of technology on their own. It might be that the extent to which technology use is expected outside class may vary widely depending on the pedagogical approach used by instructors inside the classroom.

Conclusions

Based on the findings of this study, it would seem that there was a high degree of variation of technology use among directors, teachers, and students. While directors and instructors found web-based platforms such as websites and course managers useful, students were much less inclined to agree. Instead, students reported valuing other, interactive forms of technology, such as mobile applications and social networking platforms. Different perspectives across stakeholders, while not necessarily bad, could signal a potential problem with how technology is being used, and it would therefore seem that technology for CALL needs more to succeed in language contexts than just a variety of viable tools. Brown et al. (2016, pp. 29–30) found that there was an apparent lack of communication between stakeholders in how technology was selected and integrated into language learning.

It seems, therefore, advantageous to introduce and integrate technology into a program in a way that accounts for the needs and experiences of the stakeholders. Given that students seem to have the most familiarity and experience with various forms of technology, programs utilizing CALL might consider more avenues for student input or feedback into the kinds of technologies that can be implemented inside the classroom. These may be as simple as raising stakeholder awareness of potential resources, and indeed that was one of the goals of this project. Other alternatives might include working directly to provide students—and ideally all stakeholders—with the space to discover and integrate new technologies into the curriculum, perhaps in the form of time in class spent researching or sharing technology, or other stakeholder-to-stakeholder interactions such as professional development opportunities or student-involved workshops.

It seems possible that an increased awareness of stakeholder views could also facilitate the implementation of more varied technologies. Learners here found that alternative technologies were generally useful outside the classroom, but appeared limited by those technologies that were actually used in

the classroom, those same technologies that teachers might tend to overly rely upon. Findings from Brown et al. (2016) showed that directors and teachers found CALL technology difficult to implement in a timely and effective manner, and this would seem to limit what students are exposed to in learning environments. Thus, it is our belief that learners could be an excellent source of information for directors and instructors about the possibilities related to CALL technologies in the classroom and even help overcome the sharp learning curves that instructors face when it comes to new technology.

Notes

1. Authors' Note: This study was sponsored by the Language Flagship Technology Innovation Center supported through a grant by the Department of Defense. However, the views do not necessarily represent the policy of the Department of Defense, and one should not assume endorsement by the Federal Government.
2. The Language Flagship program is a concerted national effort to transform the ways foreign languages are learned in the United States. For more information, see http://thelanguageflagship.org
3. Originally, a four-point scale was used, but an error in the online survey software forced us to use a three-point scale.
4. Note that the assumptions and design conditions for these two ANOVAs were checked extensively and addressed for univariate and multivariate outliers, normality, equality of variances, unequal sample sizes, linearity of relationships, and multicollinearity.

About the Authors

Jonathan Trace is an assistant professor at Keio University, Japan in the Faculty of Environment and Information Studies. His primary research interest is in second language assessment and, in particular, classroom assessment and learning practices. He also works in the areas of curriculum design, corpus-linguistics, crowdsourced data methods, quantitative research methods, and listening and speaking pedagogy.

James Dean Brown ("JD") is currently Professor of Second Language Studies at the University of Hawai'i at Mānoa. He has spoken and taught in many places ranging from Australia to Venezuela. He has published numerous articles and books on language testing, curriculum design, research methods, and connected speech. His most recent books are: *Mixed Methods Research for TESOL* (2014, Edinburgh University Press), *Cambridge Guide to Research in Language Teaching and Learning* (2015 with Coombe, Cambridge University Press), *Teaching and Assessing EIL in Local Contexts around the World* (2015 with McKay, Routledge), and *Introducing Needs Analysis and English for Specific Purposes* (2016, Routledge).

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Center (http://lftic.lll.hawaii.edu) at the University of Hawai'i at Mānoa. His work is situated at the intersection of language learning and technology. Within the broad area of instructional technology, he is primarily focused on faculty development programs, project-based learning, materials development, online course design, and design-based research. Rodriguez has published and presented extensively on instructional technology and design-based research.

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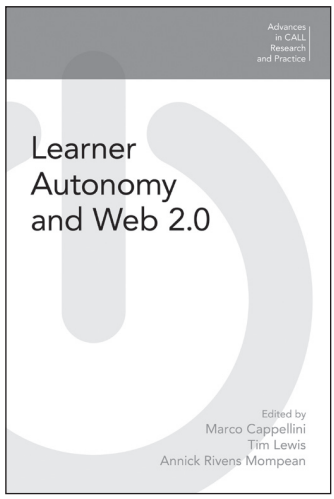
Appendix A: Brief Descriptors and Full Descriptions (as Worded in the Original Questionnaires) for the Technologies in this Study

Brief Descriptors	Descriptions as Worded in Original Questionnaires
Course Managers	Course management systems (e.g., Blackboard, Canvas, Sakai, Moodle)
Class Websites	Class website created by the instructor (e.g., Google Sites, Weebly)
Online Resources	Online multimedia resources (e.g., online videos, podcasts)
A/V Conferencing	Online communication and video-conferencing tools (e.g., Skype, Google Hangouts, Adobe Connect)
Chat/Messaging	Online, synchronous messaging (e.g., Google Talk, AIM)
Discussion Boards	Online discussion boards (e.g., Paltalk, Skypecast)
Corpus Resources	Corpora or corpus-based resources (e.g., the Contemporary Corpus of American English)
Blogs	Collaborative blogging tools (e.g., Wordpress, Tumblr, Wikis)
Social Networking	Social media (e.g., Facebook, Twitter)
General Websites	General online/website content (e.g., Google, Wikipedia, news sites)
Language Websites	Language specific web content (e.g., COERLL, BBC Languages)
Language Exchanges	Telecollaboration and language exchange sites (e.g., Livemocha, Italki, Cultura)
Language Software	Commercial language learning software (e.g., Rosetta Stone)
Mobile Apps	Mobile language learning applications (e.g., Duolingo, Babbel)
Role-Play Games	Online virtual worlds or role-playing games (e.g., Second Life, Quest Atlantis, World of Warcraft, etc.)
Vocabulary Tools	Vocabulary learning tools (e.g., online dictionaries, Lingro)
Assessment Tools	Web-based assessment tools
Media Editing	Tools for creating and editing multimedia (e.g., Audacity, Photoshop)

Learner Autonomy and Web 2.0

Edited by Marco Cappellini, Tim Lewis and Annick Rivens Mompean



Learner Autonomy and Web 2.0 explores tensions between 'classical' definitions of learner autonomy and the learning dynamics observed in online contexts. Autonomy is viewed as emerging and developing in a complex relationship with L2 proficiency and other competencies. A wide diversity of environments is featured, ranging from adaptive learning systems, through mobile apps, to social networking sites and – almost inevitably – MOOCs. Paradoxically, autonomy appears to flourish in some tightly restrictive contexts, while users of avowedly open platforms are seen to experience difficulty in learning to self-regulate.

David Little and Steve Thorne set the stage with a discussion exploring the evolution of language learner autonomy, from its origins in the era of self-access resource centers to its more recent instantiations in online (and offline) learning communities. Other contributors explore how autonomy can be exercised within adaptive learning systems, how adult learners in a teletandem exchange envisage metacognitive competences, how mobile apps support the emergence of autonomy among primary level language learners, and how collaborative language learners, using social media, demonstrate learner autonomy with an empathetic dimension. Finally, two chapters chart the challenges faced by autonomous learners in unsupported environments, whether on MOOC platforms, or using informal means.

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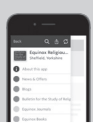

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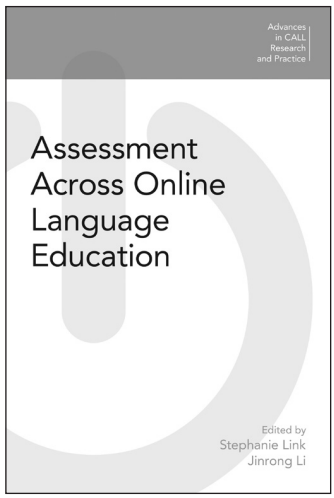
Assessment Across Online Language Education

Edited by Stephanie Link and Jinrong Li



With the expansion of online language learning opportunities, language teachers and learners are presented with an increasingly diverse range of tools to facilitate language learning in various contexts. However, CALL researchers and practitioners often have limited knowledge about the effectiveness of online language learning on pro ciency gains, primarily due to a lack of empirical studies. Despite the challenges in assessing language learning online, the editors of this volume believe the range of online language learning opportunities has brought new tools and methods to both strengthen assessment and inform pedagogical decisions in online language teaching. Technologies offer various ways to complement achievement and pro ciency measures of language learning outcomes while allowing the assessment to be incorporated for the purpose of more effective learning (e.g., adaptive learning) and teaching (e.g., technology mediated dynamic assessment and teacher intervention). more effectively, and such developments can motivate researchers and practitioners to re-conceptualize the role of assessment in online language education.

Assessment Across Online Language Education examines these challenges that have emerged in online language teaching and learning, explores the new opportunities for language teachers and learners, and provides suggestions for future research on assessment and learning in online language education.

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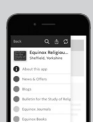

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