The Reading Matrix: An International Online Journal
Volume 16, Number 2, September 2016

Factors that Facilitate or Hinder the Use of Computer-Assisted Reading in the L2 Reading Classroom

Khalid Al-Seghayer
Al Imam Mohammad Ibn Saud Islamic University

ABSTRACT

This study examined factors associated with whether instructors of English as a second or foreign language (ESL/EFL) incorporate computer-assisted reading (CAR) into their second-language (L2) reading classrooms. To achieve this goal, 70 ESL/EFL instructors completed a survey containing 37 items and 1 open-ended question concerning their perceptions of factors that influenced their use of computers to deliver L2 reading content. The data obtained were subjected to both descriptive and inferential statistical analyses, including means and standard deviations, as well as paired t-tests and bootstrapped p-values. Results indicated that various factors facilitate and impede the successful integration of computers into L2 reading instructors' teaching practices. These findings and their theoretical and practical implications are discussed in the light of the CAR knowledge base.

INTRODUCTION

Reading is no longer limited to traditional formats and practices. However, even in this era of technology-enhanced learning environments, many instructors of English as a second or foreign language (ESL/EFL) do not attempt to harness the potential of technological features in teaching second-language (L2) reading courses, and have not moved beyond mechanistic or low-level computer use in their instruction, while others have chosen to adopt a wait-and-see approach.

As key stakeholders in the integration of computer-assisted reading (CAR) in L2 reading classrooms, instructors maintain control over their implementation. Accordingly, English instructors' perceptions of, and attitudes about, the integration of computer technology must be examined closely to understand their biases and the factors that facilitate or hinder their use of computer technologies. There is a reciprocal relationship between perceptions, attitudes and computer integration, which are linked so inextricably that one triggers the other. Thus, instructors' attitudes are major predictors of their use of new technologies in instructional settings. Specifically, ESL/EFL instructors' attitudes about technology influence their integration of CAR in the L2 reading classroom positively or negatively. By acknowledging these factors, ESL/EFL instructors can find solutions that enable them to use computer technology applications in L2 reading instruction more effectively.

Therefore, this study investigated the factors that influence whether ESL/EFL instructors integrate computer technology into their classrooms. Of specific interest

was the instructors' perceptions of the factors that contributed to their decision to use computers to deliver L2 reading content.

LITRATURE REVIEW

As was noted previously, instructors' attitudes about integrating computers largely determine their use of these technologies in the L2 reading classroom. In addition, these attitudes influence students' success in employing computers in the learning process. For example, in a study of immigrant ESL students' use of multimedia software, Trogia (2004) found that the students failed to make progress because of a lack of instructor involvement and intervention during the process of learning to use computers as instructional tools. Thus, understanding the factors that influence instructors' incorporation of CAR is essential in ensuring that their students are able to exploit all of the benefits available to them through computer technology.

The factors that deter ESL/EFL instructors from integrating CAR into their instruction fall into two categories: external and internal concerns. Focusing largely on external factors, Lee (2000) identified four categories of barriers to the use of computer-assisted language learning (CALL) in the ESL/EFL classroom: financial barriers; the availability of computer hardware and software; technical and theoretical knowledge, and acceptance of the technology. Similarly, Gilakjani, Sabouri, and Zabihniaemran (2015) identified seven barriers: the availability of hardware and software; lack of computer knowledge; lack of computer experience; inadequate computer technology support; time factors; lack of professional development in the integration of computer technology in instructional practices, and teachers' attitudes.

With respect to teachers' attitudes, Freeman and Johnson (1998) argued that teachers are not empty vessels waiting to be filled with theoretical and pedagogical skills; rather, they are individuals who enter teacher education programs with prior experiences, personal values, and beliefs that inform their knowledge about teaching and shape what they do in their classrooms (p. 401).

As Carless (1999) maintained, teachers' attitudes are derived primarily from their own experiences as learners, their professional training, teaching experiences, interactions with colleagues, and the cultural values and norms of the society in which they live.

Thus, despite the rapid development of computer technology and ESL/EFL teachers' recognition of its importance and effectiveness of computer technology as part of their methodology, various barriers impede their integration of computers into English classrooms, in general, and into reading instruction, in particular. For example, Brantmeier (2003) examined 10 informed university-level language instructors' perceptions of the integration of technology into the process of L2 reading instruction. In their responses to a questionnaire about their perspectives on using CALL to teach L2 reading, the participants identified three main factors that impeded their full integration of technology: the time commitment required to create and use materials, the rate of technological change, and technical difficulties.

Similarly, Arkin (2003) investigated EFL instructors' attitudes about, and approaches to, using an online supplementary resource for vocabulary instruction. He administered a self-developed questionnaire to 97 teachers at an English-medium university. The findings revealed that the amount of training the instructors received determined their attitudes about computers and their use of computer technology resources. Thus, Arkin postulated that training is a key factor in both changing attitudes and encouraging ESL/EFL teachers to incorporate technology into their

instructional practices.

Velazquez-Torres (2006) continued this line of inquiry and surveyed 38 Puerto Rican EFL teachers' perceptions of, attitudes about, and experiences with, computer technologies in their classrooms; he also interviewed nine of these teachers. Velazquez-Torres found that several factors had a negative effect on the instructors' use of computers. These were concerned primarily with insufficient formal training in necessary technological skills, and insufficient access and exposure to technology and internet resources.

Adopting a similar approach, Lu (2006) conducted a survey study to identify key barriers to the use of computers in ESL instruction. 67 ESL teachers from various school levels in Texas responded to a questionnaire with 5 open-ended questions and 29 variables concerning the use of CALL. The results identified three key barriers to teachers' use of computers: technology skills; funding for teaching through technology, and acceptance of technology.

To examine Korean teachers' perceptions and perspectives on the use of the Internet for teaching purposes, Shine and Son (2007) asked 101 Korean secondary EFL teachers what they thought about Internet-assisted language teaching, how they used the Internet, and what types of resources they used. Based on their findings, Shine and Son identified several contributing factors in the use of the Internet as an instructional tool, including teachers' personal interest in Internet use, their ability to integrate Internet resources into classroom activities, and the availability of computer facilities and technical support in schools.

Similarly, Ramanair and Sagat (2007) investigated the knowledge and attitudes of 50 Malaysian secondary English teachers regarding multimedia technology. The participants responded to an attitude scale consisting of 15 items involving cognitive, affective, and behavioral categories. According to the results, 80% had a positive attitude about using multimedia technology. The authors postulated that the teachers' higher level of knowledge of multimedia technology obtained either through formal training and exposure, or self-instruction, informed this positive attitude.

In Park and Son's (2009) study of factors that affect EFL teachers' use of computers in their classrooms and their perceptions of CALL, 12 EFL Korean teachers responded to a self-developed questionnaire and participated in in-depth follow-up interviews. The results revealed that the teachers held positive attitudes about the use of computers; however, various external factors affected their attempts to integrate computers into their instruction negatively, including lack of time, insufficient computer facilities, rigid school curricula, and textbooks, and a lack of administrative support. In addition, three internal factors affected their attitudes: limited computer skills and knowledge, and their beliefs and perceptions of CALL.

Adopting a similar focus, Dashtestani (2012) investigated Iranian EFL teachers' attitudes about CALL and possible barriers to its implementation. The 212 participants responded to questionnaires, participated in semi-structured interviews, and were observed in their English classrooms. Dashtestani found that the teachers had positive attitudes about CALL; however, again, several barriers prevented them from integrating computers into their classrooms. Thus, despite their strong beliefs regarding the importance of using computers in EFL courses, the Iranian EFL teachers did not make use of CALL in their courses.

Finally, Aydin (2013) examined 157 Turkish EFL teachers' perceptions of computer use in teaching EFL and their perceived self-confidence in integrating computers into EFL instruction. The participants expressed positive perceptions of

computer integration and exhibited very positive attitudes about computer use. However, they also indicated a lack of technical and instructional support and difficulties using the software programs.

Although the studies above explored ESL/EFL instructors' perceptions of integrating CALL, and factors that either obstructed or facilitated such endeavors, none investigated specifically instructors perceptions' of either the importance and effectiveness of computer technology in L2 reading classrooms or the factors that contribute to or militate against an instructor's decision to use computers. Therefore, this study directed attention to an untapped area of research within the field of computer-assisted L2 reading instruction. The foregoing results and the theoretical speculations or assumptions of existing empirical studies constituted the theoretical basis for this study.

Overall, most existing studies in the literature have confirmed that various factors are involved in an instructor's decision to implement CAR in the L2 reading classroom. Many study participants have pointed to external institutional barriers, such as limited funding and access to both technology and technical support, as strong deterrents to computer integration. However, most of these studies highlighted the primary influence of instructors' attitudes about CALL in their implementation of computer technology in the EFL classroom, which was correlated strong with a lack of training and related lack of self-confidence.

THE CURRENT STUDY

To address this significant gap in the literature, this study was designed to investigate ESL/EFL instructors' perceptions about using computers in the L2 reading classroom, and the factors that contribute to their decisions regarding whether to utilize computers in the delivery of L2 reading content.

The study's goals are outlined in the following two focal questions:

1) Do any factors exert a higher or lower than average degree of influence on instructors' decisions about whether to use computers in their L2 reading classrooms?
2) In your view as an ESL/EFL instructor, what factors facilitate or hinder the integration of CAR resources into L2 reading instruction?

To answer the first question, the study tested the following hypothesis (H_0):

ESL/EFL instructors do not believe time, easy access to computers and software, technical support, knowledge of users, or users' willingness are decisive factors in choosing to use computers in the L2 reading classroom.

METHODS

Participant Characteristics

The participants were selected according to their teaching experience. Each had spent at least 5 years teaching college-level English, and at least 3 years teaching reading to college ESL/EFL learners. In addition, all had more than 2 years of experience using computers in instruction. As there were no other explicit criteria for participation, a convenience sample was selected that consisted of 70 college level ESL/EFL instructors at various universities. The participants included 39 males (56%)

and 31 (44%) females who ranged in age from 30 to 50, with most in their 30s. With respect to native languages, the majority were native Arabic speakers (36); 19 spoke English (13 U.S.; 2 British; 2 Canadian; 1 Australian, and 1 New Zealand); and the remainder spoke other languages, including German, Thai, and Portuguese. The participants had 2 to 15 years of teaching experience, with a mean of 9 years, and 55% had used computers in the classroom for more than 5 years. Those who had more experience in the field were assumed to have a wider range of experience teaching L2 reading and a rich perspective on changes that have occurred in the ESL/EFL field. Eight (11%) had bachelor's degrees, 36 (52%) had master's degrees, and 26 (37%) had doctoral degrees. Table 1 presents the participants' demographic information.

Table 1

Demographics and Profiles of Participating ESL/EFL Instructors

	%
Gender	
Male	*56%*
Female	*44%*
Ages	
25–34	55%
35–44	24%
45–55	14%
60 and above	7%
Highest degree held	
B. A.	11%
M. A.	52%
Ph. D.	37%
Years of teaching experience	
Less than 1 year	9%
1–4	16%
5–8	16%
9–12	13%
13–16	8%
17 or more	38%
Years of using computers in teaching	
Less than 1 year	7%
1–2	15%
3–4	23%
5 and more	55%

Instruments: Constructing the Survey

This study incorporated standard survey methodologies to gain insight into the factors that influenced these ESL/EFL in instructors' decisions about whether to employ computer technology in L2 reading instruction. The researcher developed a two-part, unidimensional, cross-sectional survey based on Likert scales to assess influential factors. The survey included 37 statements presented in random order and divided into two sections, as shown in Table 2:

- Section 1, *Background Information*, surveyed the participants' demographic information with nine Yes/No and multiple-choice questions. Data collected included gender, age, educational experience, years of teaching experience, level of education completed, level of comfort using computers in teaching, and computer experience.
- Section 2, *Factors Scale*, included 28 statements that described factors that facilitate or hinder ESL/EFL instructors' use of computers in the L2 reading classroom. The instructors were asked to respond to each statement using a five-point scale ranging from a "Strong Positive Influence" to a "Strong Negative Influence," with a midpoint of "No Influence." The questions addressed various internal factors (five factors with three statements each) and external factors (five factors with three statements each) such as time constraints, the accessibility and availability of computers and relevant facilities, technical and administrative support, training in the ways in which to integrate technology into L2 reading classrooms, technical skills and theoretical knowledge, personal attitudes about the use of computers, belief in the usefulness of computers for L2 reading, and the self-confidence or efficacy to use technology effectively in L2 reading instruction. Section 2 also included an open-ended question developed to elicit instructors' views pertaining to these factors that the Likert-scale items may not have captured. This open-ended question provided qualitative data that enriched the quantitative responses, helped clarify issues identified in the survey, and produced a more in-depth understanding of the issues.

Table 2

Sections	Section 1	Section II
Type of questions/statements	Background information	Probed the factors facilitating or limiting instructors from integrating computers in L2 reading classrooms
Number of questions/statements	9	28

Instrument validity and reliability. Several measures were used to ensure the validity and reliability of the research instrument. A panel of four experts examined the instrument for content, clarity, and appropriateness. Their comments were considered in rewording items, adding new items, modifying ambiguous wording, and deleting items deemed irrelevant to the purpose of the study.

The reliability of the instrument was assessed with Cronbach's alpha. The alpha coefficient for the factors scale was 0.93, which was within the acceptable range of reliability.

Piloting the instrument. The survey developed was pilot tested with 10 ESL/EFL instructors who were similar to the actual participants with respect to their credentials, teaching experience, and familiarity with computers as classroom teaching tools in the ESL/EFL classroom. These instructors were not included in the final sample. The pilot test was conducted to ensure and improve the survey's validity, reliability, and internal validity, test the instrument's adequacy, and identify

potential practical problems in using the instrument, as well as whether the items yielded the targeted information. The instructors were asked to examine the wording and order of the questions closely, as well as identify any confusing or ambiguous use of the items or range of answers. They were also asked to indicate any difficulties they faced in completing the survey. Interviews with each instructor were conducted after they completed the survey to elicit further details and feedback concerning the issues above, and the instrument was modified according to their comments and suggestions.

Survey administration and data collection process. The survey was distributed in three stages. First, the researcher sent each voluntary participant a packet containing a letter describing the purpose of the study, the importance of their participation, a copy of the survey to which an assigned four-digit ID code was affixed, instructions explaining how to respond to the survey, and an envelope in which to return the completed survey to the researcher. The ID codes were recorded in a separate file to track who returned the survey.

In the second stage, the researcher sent an e-mail reminder to those who had not responded after 2 weeks that included a link to the online version of the survey. In the third stage, after an additional two weeks, the researcher sent a final reminder to those who had not yet responded and included another copy of the survey.

Of 85 ESL/EFL instructors surveyed, 70 returned the survey, for a return rate of 83%. All 70 participants responded to all items on the survey; thus, there were no missing data. The researcher was available to the participants throughout the data collection process to answer any questions they had.

Data analysis procedures. The completed surveys were compiled into an Excel spreadsheet and then imported into an SPSS dataset. The items were codified to form multi-item scales of influence on CALL use. The reliability of the items in each section was computed, and any items that exerted an appreciable negative effect on reliability were eliminated. The mean scores in each section were then computed to represent scores on the construct purported to be measured in each section. Descriptive statistics were computed for the scale scores generated for each section.

The proposed hypothesis focused on each of the 28 factor items separately with respect to whether the mean of the item differed significantly from those of the other 27 items. Accordingly, in each case, descriptive statistics were calculated for each item and for the mean of the other 27 items. The hypothesis was tested by performing a paired *t*-test between each item and the respective mean of the other 27 items. The normality of the distribution of differences in each case was tested using the D'Agostino-Pearson test. For any case in which there was a significant departure from normality, bootstrapping was used to estimate the *p*-value of the difference, and the alpha level for each *t*-test was corrected to achieve a familywise Type I error rate of 0.05. Given the multiple tests used to assess the differences between the same set of variables, it also was necessary to adjust the alpha level of the individual comparisons to achieve a familywise Type I error level of 0.05. This was accomplished by applying the Bonferroni correction, which resulted in a requisite *p*-value of 0.002 to attribute statistical significance to any comparison. The resulting *p*-values are listed in the last column of Table 3.

RESULTS

The hypothesis predicted that the mean of one or more of the 28 questionnaire items describing factors that influence an instructor's decision to use CALL would differ from the mean of the other 27 influence items. This hypothesis was tested using the paired *t*-test of the difference between each item's mean and the mean of the complementary average of the other 27 items for all cases where the normality assumption was satisfied. In cases where the distribution of differences departed significantly from normality, a 5,000 sample bootstrapping process was used to estimate the *p*-values. Table 3 presents the descriptive statistics for the influence items and the *p*-values pertinent to the test of the divergence of each item mean from the mean of the other 27 influence items.

Table 3. *Descriptive statistics and results of tests of differences between Section 2 items and their complementary 27-item averages*

Influence on CALL use decision	N	Minimum	Maximum	Mean	SD	*p*-value of difference
1. Time necessary to plan computer-based reading activities	70	1	5	3.69	1.22	0.00[b]
2. Time required to locate appropriate CALL reading materials	70	1	5	3.77	1.25	0.01[a]
3. Time and effort needed to learn how to integrate technology into L2 reading instruction	70	1	5	3.73	1.18	0.00[b]
4. Amount of effort required to load the syllabi into the program and the amount of time available to learn how to integrate computer-based reading activities into an L2 reading class	70	1	5	3.56	1.19	<0.00[a]
5. Ease of access to computers	70	1	5	4.13	1.05	0.80[b]

Influence on CALL use decision	N	Minimum	Maximum	Mean	SD	*p*-value of difference
6. Availability of high-quality L2 reading software and technology-enhanced resources	70	1	5	4.01	1.16	0.40[b]
7. Availability of sufficient facilities	70	1	5	4.07	1.12	0.65[b]
8. Your perception of the degree of technical and administrative support that would be available	70	1	5	4.01	1.11	0.49[a]
9. Your perception of the degree of support that is offered by staff	70	1	5	3.84	1.16	0.02[a]
10. Your perception of the degree of support by the department for integrating CALL reading materials and resources into L2 reading classes	70	1	5	4.06	1.13	0.76[b]
11. Availability of in-service and workshop training on how to integrate CALL into an L2 reading class	70	1	5	4.10	1.11	0.77[b]
12. Availability of training in the use of technology in the classroom	70	1	5	4.29	0.95	0.04[b]

Influence on CALL use decision	N	Minimum	Maximum	Mean	SD	*p*-value of difference
13. Technological training received on how to guide students in the use of CAR language learning programs	70	2	5	4.19	0.95	0.18[a]
14. Your relevant technical skills in using the computer as an instructional L2 reading tool	70	2	5	4.36	0.68	<0.001[a]
15. Your knowledge of how to take advantage of what technology can offer L2 reading instruction	70	1	5	4.31	0.83	0.01[b]
16. Your knowledge of the features of CALL that enhance the L2 teaching and learning processes	70	1	5	4.24	0.86	0.12[b]
17. Your knowledge of theories and research on the effect of integrating CALL materials into L2 reading class	70	1	5	4.06	1.05	0.57[b]
18. Your knowledge of the theoretical basis for CALL	70	1	5	4.00	0.87	0.14[b]

Influence on CALL use decision	N	Minimum	Maximum	Mean	SD	*p*-value of difference
19. Your knowledge of the advantages that computers can bring to L2 reading instruction	70	1	5	4.31	0.86	0.01[b]
20. Your opinion regarding the expected benefits that technology brings to teaching and learning L2 reading	70	2	5	4.23	0.82	0.12[a]
21. Your expectations for the outcomes that computers can have on L2 reading	70	2	5	4.23	0.69	0.08[a]
22. Your opinion regarding the usefulness of computers in teaching and learning L2 reading	70	2	5	4.39	0.73	<0.001[a]
23. Your willingness to make a time commitment and to take personal risk to integrate computers into the L2 reading classroom meaningfully	69	1	5	4.33	0.78	0.00[a]
24. Your openness to change	70	2	5	4.43	0.73	<0.001[b]
25. Your knowledge of how computers can enhance your success at teaching English	69	2	5	4.29	0.73	0.01[b]

Influence on CALL use decision	N	Minimum	Maximum	Mean	SD	*p*-value of difference
26. Your belief in your own ability to use a computer effectively to teach L2 reading	69	1	5	4.38	0.71	<0.001[a]
27. Your sense of self-efficacy in using a computer to teach L2 reading	69	1	5	4.25	0.85	0.01[b]
28. Your feeling of not being in complete control when you use a computer	66	1	5	3.58	1.37	0.00[b]

Given the multiple testing of differences between the same set of variables, it was necessary to adjust the alpha level of the individual comparisons to achieve a familywise Type I error level of .05. This was accomplished by applying the Bonferroni correction, which resulted in a requisite *p*-value of .002 to attribute statistical significance to any comparison. The resulting *p*-values are listed in the last column of Table 3. According to the results, 7 of the 28 influence items differed significantly from the averages of the other 27 items. Therefore, the null hypothesis was rejected.

Four items exerted significantly more influence than average, as follows:

14. Your relevant technical skills in using the computer as an instructional L2 reading tool.
22. Your opinion regarding the usefulness of computers in teaching and learning L2 reading.
24. Your openness to change.
26. Your belief in your own ability to use a computer effectively to teach L2 reading.

Three items exerted significantly less influence than average, as follows:

1. Time necessary to plan computer-based reading activities.
3. Time and effort needed to learn how to integrate technology into L2 reading instruction.
4. Amount of effort required to load the syllabi into the program, and the amount of time available to learn how to integrate computer-based reading activities into an L2 reading class.

The mean ratings of all 28 items fell within the interval labeled “positive influence.”

Open-Ended Question

The participants were also asked the following open-ended question: "In your view, what factors facilitate or hinder the integration of CAR resources into L2 reading instruction?" In the 64 comments collected, the participants identified various hindrances and addressed the following six issues.

First, in 10 remarks, the participants identified the following as hindrances to CAR integration: insufficient time to locate and prepare digital reading materials, and the potential for interruptions to teaching and learning time and individualized lessons; dealing with these interruptions, monitoring computer use, and providing assistance affected teachers' time further.

Second, in 15 remarks, the participants highlighted as hindrances a shortage of computers and CAR resources, and the necessary facilities, including access to the Internet, newer technology, and computer labs.

Third, in 21 remarks, the participants stated that teachers' personal stances can inhibit computer integration. In particular, they indicated that they: had made no serious attempts to use computers, or were willing to do so, in practice; lacked a positive attitude about their use; did not know how to use them effectively; did not believe personally in the effectiveness of using computers in teaching L2 reading; lacked sufficient experience and technical knowledge; had insufficient knowledge of recent theories and pedagogical philosophies to articulate how to integrate computers into L2 reading classrooms effectively, and lacked other factors that facilitate the integration of CAR resources into L2 reading classrooms.

Fourth, in seven remarks, the participants described a lack of administrative support related to adequate CALL training opportunities, encouragement and recognition of efforts, and availability of proper equipment.

Fifth, in seven remarks, the participants stated that there was no continuous technical assistance.

Sixth, in four remarks, the participants identified learner attitudes as a contextual factor that exerted a negative effect on the incorporation of computers into the L2 reading classroom. In particular, learners were often uninformed about the ways in which to exploit computers' capabilities to improve their reading skills. In addition, they lacked necessary skills for the effective use of technology, and were unwilling to use and accept computers fully as a valuable learning tool.

DISCUSSION

The data suggested that various factors inhibit the incorporation of CAR into the L2 reading classroom. The most significant factors identified were teachers' personal characteristics, including: (a) their degree of openness to change, (b) the ability to use a computer effectively to teach L2 reading, (c) skepticism about the usefulness of computers in teaching, and (d) the relevant technical skills needed to use computers as an instructional L2 reading tool. Less influential factors included (a) the time necessary to plan computer-based reading activities, (b) the time and effort needed to learn how to integrate technology into L2 reading instruction, (c) the amount of effort required to load the syllabi into the program, and (d) the amount of time available to determine how to integrate computer-based reading activities into an L2 reading class. These factors also fall under internal or personal factors and teacher-related factors, such as teachers' attitudes, CAR and their knowledge of, and skills in, CAR.

In response to the open-ended question, the participants identified various external or contextual factors. Negative factors included the lack of availability of necessary facilities, lack of administrative support, and lack of continuous technical assistance. Learner attitude also was a contextual factor that affected the incorporation of computers into the L2 reading classroom negatively.

The results were consistent with those of other studies on the various factors that hinder ESL/EFL instructors' use of computers in L2 reading classroom practices, such as Brantmeier (2003), Shine and Son (2007), and Park and Son (2009). These studies pointed to both internal and external limiting factors, such as teachers' lack of knowledge and resources, lack of experience and access to CAR-based materials, time constraints, lack of computer-based facilities, lack of financial and technical support, and inadequate teacher training programs.

Pedagogical and Technological Implications

This study has several pedagogical and technological implications. With respect to pedagogical implications, to ensure that computers are used in the most effective manner, ESL/EFL instructors need to acquire a base of technology-supported pedagogy knowledge and skills. This knowledge will assist them in implementing computer-based learning in their classroom practices efficiently and effectively. ESL/EFL instructors also need to consider learners' reading abilities, text types, their degree of control over the electronic content under study, issues involved in attending to and processing various modes of information associated with electronic texts, and ways to optimize reading performance when text is displayed electronically. Further, ESL/EFL instructors need to develop technology-related classroom management skills to organize L2 reading classes effectively.

With respect to technological implications, ESL/EFL instructors clearly require in-service professional development training opportunities with unique characteristics in terms of their nature and length, together with the provision of state-of-the-art infrastructure and cutting-edge facilities. General, technical, and specialized training in L2 reading theory should be offered to L2 reading instructors so they can make informed decisions about integrating computers into their classrooms. Additionally, instructors need to develop the necessary technological skills and learn how to design reading tasks and activities to make computer-based instruction and resources more appealing and accessible to L2 learners.

These instructors may also benefit from general technological training opportunities in different formats. Such training would offer them hands-on experience incorporating CAR instruction into their plans, and delivering L2 reading instruction based on sound pedagogical and practical skills. Through such training, instructors can learn how to: (a) use available technological reading resources effectively, (b) create or select computer-based reading activities, (c) develop CAR lessons, and (d) integrate technological reading resources into the L2 reading classroom.

At the institutional level, ESL/EFL reading instructors need access to modern and functional computer facilities with appropriate sustained technical support. These facilities also should feature reliable, high-speed broadband Internet connections and administrative support at different levels, including departmental, college, and university. Of equal importance is the provision of useful reading software programs, websites, and related technology-enhanced reading materials and resources. Institutions also must work with the instructors involved to develop CAR integration plans with specifically articulated goals and guidelines.

Limitations and Considerations for Future Research

This study had several limitations. First, it only included ESL/EFL instructors at the university level. Including instructors at different levels could provide further useful data. Second, this study did not investigate further aspects of ESL/EFL perceptions of, and attitudes about, integrating instructional technology into L2 reading. Third, the self-report instrument contained only 28 statements, which may be insufficient for a comprehensive taxonomy of factors that contribute to decisions about computer integration. Fourth, except for the one open-ended question, this study focused largely on quantitative measures of barriers to computer integration. A mixed methods approach may elicit more in-depth data.

With respect to future research, this study provided insight into several variables that influence ESL/EFL instructors' decisions to incorporate computer technology into their L2 reading classrooms. The results suggest that additional research on the subject is required. Future studies should explore other internal and external factors that influence instructors' integration of computers into L2 reading their classrooms. Studies also should examine the relationship between ESL/EFL teachers' beliefs and practices to shed further light on how they make decisions to integrate technology. Further experiments also could explore ESL/EFL instructors' approaches to using computer technology resources in their L2 reading instruction and the extent to which they apply these resources and tools in their practices.

CONCLUSION

This study identified key factors that motivate or deter ESL/EFL instructors' integration of computers into their L2 reading classrooms. The results revealed both context- and instructor-related impediments, including a lack of equipment and resources, time constraints, and inadequate technical and administrative support, as well as inadequate training, negative attitudes about using computers in L2 classrooms, and limited knowledge and skills. Conversely, factors that facilitated teachers' recognition of the usefulness of CAR included perceived departmental support—which often encourages the integration of CALL reading materials and resources into L2 reading classes—and technological training on ways in which to guide students in using computers and CAR programs.

The findings of this study should serve as a starting point for future exploration of ESL/EFL instructors' perceptions of integrating computers into the L2 reading classroom and the factors that influence their adoption. The outcomes of this study also may be useful in shaping computer integration practices in L2 reading these classrooms and promoting efforts to provide ESL/EFL instructors with the skills, knowledge, and attitudes necessary to infuse computer technology into the L2 reading classroom and exploit all available reading resources and learning opportunities. It is hoped that this study will stimulate additional research in these domains and encourage future studies of ESL/EFL instructors' roles in integrating computers into L2 reading, as such research is needed to develop a thorough understanding of the issue and confirm the findings of this study.

Khalid Al-Seghayer earned his Ph.D. in Applied Linguistics from the University of Pittsburgh in 2003. His research interests include Computer-Assisted Language Learning and second language reading. He has taught English in the Kingdom of Saudi Arabia and the United States of America, and over the years, has taught a wide range of language-related subjects. His work has been published in *TESOL Quarterly*, *Language Learning and Technology*, *CALL Journal*, *Internet TESL Journal*, *CALICO Journal*, and *CALL-EJ* Online. His recent books are *English Teaching in Saudi Arabia: Status, Issues, Challenges*, and *Various Thoughts Concerning Teaching and Learning English*. He served as the chair-elect (2002-2003) of the EFL Interest Section in TESOL, the editor of the NNEST Newsletter in TESOL (2002-2004), the chair-elect of the Non-Native English Speakers (NNEST) in TESOL (2003-2004), and the editor of the *CALL Media Software of Reading Matrix Journal* (2003-2007). He was the chair of the English Department at Imam University, and now is the chair of the English Department at Saudi Electronic University. He serves currently as an editorial board member and reviewer for a number of journals, including *Reading Matrix*, *TESOL Journal*, *CALICO Journal*, *Foreign Language Annuals Journal*, *Arab World English Journal*, *CALL Journal, IJCALLT Journal,* and the *International Journal of Applied Linguistics & English Literature.*

Email: alseghayer@yahoo.com

REFERENCES

Arkin, E. (2003). Teachers' attitudes towards computer technology use in vocabulary instruction. Master's Thesis. Ankara, Bilkent University, Turkey.

Aydin, S. (2013). Teachers' perceptions about the use of computers in EFL teaching and learning: the case of Turkey. *Computer Assisted Language Learning*, 26, (3), 1-20

Brantmeier, C. (2003). Technology and second language reading at the university level: Informed instructors' perceptions. *The Reading Matrix Journal,* 3. 50–74.

Carless, D. (1999). Factors affecting classroom implementation: Task-based curriculum renewal in Hong Kong. *International Journal of Educational Reform,* 8.374–382.

Dashtestani, R. (2012). Barriers to the implementation of CALL in EFL courses: Iranian EFL teachers'. *The JALT CALL Journal*, 8, (2), 55-70.

Gilakjani, A., Sabouri, N., and Zabihniaemran, A. (2015). What are the barriers in the use of computer technology in EFL instruction? *Review of European Studies*, 7 (11) 213-220.

Freeman, D. and Johnson, E. (1998). Reconceptualizingtheknowledge-baseoflanguageteachereducation.*TESOL Quarterly,* 32 (3), 397–417.

Lee, K. (2000). English teachers' barriers to the use of computer-assisted language learning. *The Internet TESL Journal,* 5. Retrieved from http://iteslj.org/Articles/Lee-CALLbarriers.html.

Lu, S. (2006). Barriers on ESLCALL programs in South Texas. *MERLOT Journal of Online Learning and Teaching,* 2 (3), 158-168.

Park, C. and Son, J. (2009). Implementing computer-assisted language learning in the EFL classroom: Teachers' perceptions and perspectives. *International Journal of Pedagogies and Learning,* 5 (2), 80–101.

Ramanair, J. and Sagat, G. (2007). Multimedia technology: Teachers' knowledge and attitudes. *CALL-EJ Online.*8 (2), 10-25.

Rogers. M. (1995). *Diffusion of innovations*. New York: The Free Press.

Shine, H. and Son, J. (2007). EFL Teachers' perceptions and perspectives on Internet-assisted language teaching. *CALL-EJ Online,* 8 (2), 12-22.

Trogia, G.A. (2004). Migrant students with limited English proficiency: Can fast forward language make a difference in their language skills and academic achievement? *Remedial and Special Education,* 25. 353–366.

Tseng, M. (2010). Factors that influence online reading: An investigation into EFL students' perceptions. *The Reading Matrix Journal,* 10 (1), 96-105.

Velazquez-Torres, N. (2006). How well are ESL teachers being prepared to integrate technology in their classrooms? *TESL-EJ,* 9 (4), 15-30.

Ward, H. and Mulholland, R. (2006). CALL technologies: Survey responses concerning university and school systems' responsibilities. *The Reading Matrix Journal,* 6 (3), 322-329.