# Handbook of Research on K-12 Online and Blended Learning

(Second Edition)

EDITED BY KATHRYN KENNEDY & RICHARD E. FERDIG

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# Dedication

*"Let a wise person listen and increase learning, and let a discerning person obtain guidance." (Proverbs 1:5, CSB)*

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# World Languages in Online and Blended K-12 Education

**Binbin Zheng, Chin-Hsi Lin, & Yu-Yin Hsu**

*Abstract*

This chapter is a qualitative exploration and synthesis of research on online world-language courses in K-12 settings, focusing on such courses' effectiveness and the unique challenges of maintaining the quality of language courses as they move from face-to-face to online environments. It identifies two key factors contributing to K-12 students' world-language online-learning success – self-regulated learning and interaction – while a thorough examination of teacher-level factors highlights the importance of professional development in both technological skills and pedagogical design. The chapter concludes with implications and detailed recommendations for policy and practice in K-12 world-language education, as well as future directions for research in this area.

**Keywords**: world languages, online learning, effectiveness, teaching practices, professional development

This chapter provides a qualitative synthesis of published work relating to online world-language courses in K-12 settings. It consists of six sections. The first describes the challenges of online world-language courses, and the following three review three main themes: effectiveness; factors predicting online-learning outcomes; and teaching and teacher education. The fifth section provides implications for policy and practice, as well as potential directions for future research, and the sixth, this chapter's conclusions and recommendations.

## *1. Introduction*

Enrollment in U.S. K-12 online education courses increased from 1.8 million during the 2009-10 academic year (Zandberg & Lewis, 2008) to 3.8 million in 2014-15 (Watson, Pape, Murin, Gemin, & Vashaw, 2015). Amid this dramatic increase, it is of urgent importance that the quality of online courses be maintained or enhanced, and that online teaching and learning maximize the effectiveness of online education.

World languages present unique challenges for K-12 online learning. Though computer-mediated communication has potential affordances to support online learning (e.g., being able to communicate without restrictions of time and space: see Hampel & Hauck, 2004), the lack of body language and non-verbal cues are likely to limit both the effectiveness of online world-language courses and students' perceptions of such effectiveness (Lin & Warschauer, 2015; Lin & Zheng, 2015). Cavanaugh's (2001) meta-analysis of 19 studies of the effects of online education on K-12 academic achievement found that, alone among all course-content areas, foreign-language courses yielded significantly negative effect sizes, leading the author to call for a more careful evaluation of such courses in online K-12 settings. A more recent study by Oliver, Kellogg, and Patel (2012) expressed a similar concern: online students enrolled in foreign-language courses had significantly less positive perceptions of their courses than those enrolled in other subjects. A synthesis of research on this topic by Lin and Warschauer (2015) noted that among online higher-education students, perceptions of world-language courses were in line with perceptions of other subjects, which prompts further concern about the effectiveness of online world-language courses at the K-12 level. However, research on such courses has hitherto been conducted in widely dispersed geographical areas and using a variety of methods, and this had hindered the information of any clear consensus about problems and solutions.

## *2. Research Synthesis: Effectiveness of K-12 World Language Courses*

This section reviews studies of the effectiveness of online world-language courses in fully online, blended, and virtual-reality learning environments. Due to the profound differences between first- and second-language learning, studies of English-language education in the U.S. and other English-speaking countries were excluded, except where they dealt exclusively with English-as-a-foreign-language classes.

The majority of published studies relating to online world-language courses date from after 2010. For reasons of space, our review focuses on course effectiveness, rather than on how contextual factors may have affected the findings.

### *2.1 Effectiveness of Fully Online/Blended Language Learning Courses*

In terms of the effectiveness of online world-language courses in K-12 environments, mixed results have been reported. Several studies have indicated that such courses may have negative impacts on learning. For example, Cavanaugh's meta-analysis of studies of the effectiveness of online education as compared to traditional education revealed that, while interactive distance education had positive effect sizes in most subject areas, strong negative effect sizes were detected for foreign-language courses. Similarly, Oliver, Kellogg, and Patel (2012) found that students who took foreign-language courses in a virtual school reported significantly lower satisfaction than those who took other types of online courses in the same school, across all key areas of online learning (i.e., teaching practice, course design, group collaboration, and perceived success). The same study's recommendations for enhancing students' satisfaction with online foreign-language courses included creating authentic language-learning activities, and providing better support for students' individual needs. A recent report on the effectiveness of Michigan's K-12 online courses (Freidhoff, 2017) indicated that the average pass rate in online foreign-language and foreign-literature courses in 2015-16 was 59%, far lower than the 76% average pass rate of their face-to-face counterparts. Within these figures, however, students from rural areas and small towns had much higher pass rates in the online language and literature courses (71% and 74%, respectively) than those from suburban and city areas (58% and 45%, respectively). And Jabeen and Thomas's (2015) study, although conducted among adult learners, suggested that an insufficient quantity of interactions, slow feedback, lack of opportunities to practice the target language online, and inadequate technology training were the key obstacles to effective learning of foreign languages online.

Other studies, however, have reported positive findings regarding the effectiveness of online education. A meta-analysis by Means, Toyama, Murphy, and Baki (2013) compared the effectiveness of online/blended learning against that of face-to-face instruction in both K-12 and higher education, and revealed that online instruction – and especially blended learning – was more effective than its face-to-face counterpart. Although their study did not specifically examine world-language courses, it detected no differences among subject areas, implying that the positive effect sizes of online instruction would also apply to such courses. A recent study by Lin, Zheng, and Zhang (2017) reported generally positive learning outcomes among students enrolled in online high-school-level world-language courses. Though Lin, Zheng, et al. did not directly compare their online learners' outcomes against those of face-to-face learners, their respondents reported high levels of both satisfaction (4.47 out of 5) and perceived progress (4.75 out of 5).

### *2.2 Virtual-reality Environments*

Another emerging type of online-learning environment for world language acquisition is virtual reality. A recent review by Lin and Lan (2015) found that, while the body of research on language learning in virtual-reality learning environments (VLEs) grew substantially in the period from 2004 to 2013, few such studies focused on K-12 settings. Among those that did, a majority revealed an improvement in language-learning outcomes (Rankin, Gold, & Gooch, 2006; Suh, Kim, & Kim, 2010) and/or positive attitudes towards using VLEs in language learning (Ho, Rappa, & Chee, 2009; Zheng, Young, Brewer, & Wagner, 2009).

Suh, Kim, and Kim's (2010) experimental study compared the learning outcomes achieved via traditional face-to-face lectures against those achieved via participation in a massive multiplayer online role-playing game (MMORPG) by 220 students learning English in Korea. They found that students in the MMORPG group outperformed their face-to-face peers in listening, reading and writing. These findings paralleled those of Rankin, Gold, and Gooch's (2006) pilot study,

which examined language improvement among intermediate and advanced English-as-a-second-language (ESL) learners. The participants who played Ever Quest 2 at least four hours per week increased their English vocabulary by 40% over four weeks.

As well as improved learning outcomes, language learning in VLE has been found to have positive effects on students' attitudes and perceptions. For example, Zheng, Young, Brewer, and Wagner (2009) employed a quasi-experimental design to examine 61 Chinese 7th graders' English self-efficacy and attitudes. Each child was randomly assigned either to an experimental group, which played MMORPG with native speakers on their own initiative, or to a control group, whose members studied on their own. As compared to the control group, the experimental group reported higher levels of confidence in their English communication, perceived that they had learned more, and found English more interesting. Another study, by Ho, Rappa, and Chee (2009), examined 45 Singaporean 12th graders' learning of English via the game Second Life and an online discussion forum in Singapore. Though the authors did not specifically examine improvement in language skills, they found that the VLE enhanced the participants' interest in the subject and developed their sense of belonging in the online environment. In addition, they found that the students' argumentation skills were strengthened by Second Life's negotiation-of-meaning process.

### *3. Research Synthesis: Factors Predicting Online-learning Outcomes in Language Courses*

As Blake (2008) has contended, it is important for scholars to move beyond mere comparisons of the relative effectiveness of online and face-to-face language courses, as many potentially confounding factors (e.g., individual differences, instructors, and curricula) have not been or cannot be controlled. Among the wide range of such factors that might predict learning outcomes in online world-language courses, the two main themes that have thus far emerged from the literature are self-regulation and interaction.

Self-regulation is one of the strongest predictors of students' learning outcomes in traditional settings (for a review, see Hattie, 2008). There is also a broad scholarly consensus that successful online learning requires a high level of self-regulation skills, such as setting one's own learning goals and self-monitoring one's learning progress (Barbour & Reeves, 2009; Barnard, Lan, To, Paton, & Lai, 2009). Self-regulated learning (SRL), a framework proposed by Zimmerman (2002), consists of two main factors: motivation and learning strategies. Drawing on SRL, Lin, Zhang, and Zheng (2017) surveyed 466 students enrolled in online world-language courses in a virtual school supported by the U.S. state of Michigan. Using structural equation modeling, Lin, Zhang et al. found that motivation did not predict learning outcomes (i.e., satisfaction, perceived progress, or final grades), but online learning strategies positively predicted them. The authors speculated that the insignificance of motivation in their model could have been due to the fact that, in their specific study context, the students' intrinsic motivation was moderate and their extrinsic motivation, low.

Turning to interactions, language learning is – from a sociocultural perspective – an interactive process of exploration and discovery, underscoring the need for mediation and social interaction in the development of meaning (Lantolf, 2006). Social interaction is a key component of language learning because learners develop their language skills through a meaning-negotiation process (Lantolf & Thorne, 2008); and many prior studies of face-to-face learning have documented the importance of social interaction to language development (e.g., Alison & Philp, 1998). In online-learning research, Swan (2003) highlighted the importance of interaction and urged scholars to look beyond final grades. An early study by Hampel and Stickler (2004) reported that, along with collaborative tasks, online students felt participating in intense interactions with their fellow learners was the most exciting aspect of learning and practicing a language, underscoring the importance of interaction in online language-learning environments. Adopting a sociocultural perspective, Lin, Zheng, and Zhang's (2017) aforementioned study of high-school-level online language courses in a state virtual school assessed the relationship between online interactions and learning outcomes. It employed multiple regression analysis to examine how three broad types of interactions – learner-instructor, learner-learner and learner-content (Moore, 1989) – affected students' perceived progress and satisfaction. After controlling for demographic information, motivation and learning strategies, the results showed that learner-instructor and learner-content interactions had significantly positive effects on satisfaction, whereas learner-learner interaction did not affect satisfaction, while learner-content interaction was the only factor that affected perceived progress.

In sum, self-regulation and interaction both appear to be significant contributors to online-learning success. Thus, it is important for the instructors of online world-language courses to help their students improve their self-regulation skills, while also strengthening the quantity and quality of interactions in the online environment.

## *4. Research Synthesis: Teaching and Teacher Education for Online Language Courses*

Studies of education would be ill-advised to ignore teacher-level factors, and this is perhaps especially true of online learning. The preparation needs of face-to-face and online teachers are far from identical, and it is imperative that online language teachers (as, indeed, all other online teachers) receive sufficient professional development (PD) in technology use, pedagogical design, and the integration of technology with pedagogy.

### *4.1 Teaching Practice*

Lin and Zheng (2015) examined online foreign-language instructors' teaching practices, and identified a relative lack of content-related practices such as guiding student knowledge and engaging students with content; and this was matched by a comparatively frequent use of non-content-related practices, e.g., maintaining academic integrity and keeping the course a safe place. These teachers' choices regarding such practices were not impacted by their years of online-teaching experience (contra findings in Bailey & Card, 2009 based on higher-education settings), but did appear to be related to variations in their level of control over course content. Additionally, Lin and Zheng's study shed light on teachers' managerial, social, and pedagogical role changes as they transitioned from face-to-face to online teaching, and their need for more PD in subject-based technology integration. Similar findings were reported by Stickler and Shi (2013), based on their investigation of online spoken-Chinese tutorials' multimodal teacher-student interactions (i.e., interactions involving multiple modalities, such as audio and images). The authors concluded that skillful use of online and other technologies such as audio- or video-conferencing and audio-graphic environments could bridge the gap between teachers' intentions regarding online curricula and what their students actually experience.

### *4.2 Teacher Education*

Only two studies have focused on the training of world-language teachers to teach fully online or blended courses. Both made use of Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) framework. Cheng (2017) developed a Teaching-Learning version of TPACK known as TL-TPACK, comprising five training strategies (practicum, course design, advising, peer cooperation, and reflections) intended to develop trainees' capacity for teaching online courses. Her study highlighted the importance of authentic instructional field experience for pre-service Chinese-language teachers in Taiwan, and found based on content analysis of the participants' reflections that TL-TPACK had improved their technological knowledge, technological content knowledge, and technological pedagogical knowledge. For similar reasons, but working with in-service Chinese-language teachers in the U.S., Tseng (2017) developed an intensive summer training program consisting of both face-to-face and online training components. After six weeks, Tseng's participants' confidence in teaching the target language online had improved, and this was ascribed to the training program's creation of meaningful contexts for communication.

### *4.3 Technology and Teaching Skills*

Teaching approaches used in traditional face-to-face language courses may not be suitable for online environments (Compton, 2009; Lin & Zheng, 2015). For this reason, several studies have investigated and evaluated which language-teaching skills are most appropriate to online settings. Compton (2009) emphasized the different skills needed for teaching languages as opposed to other subjects online, noting the equal focus of beginning-level language courses on the content and the forms of interactions. With the aim of improving training programs for language teachers, Compton proposed a new framework covering three aspects of skills (i.e., technology, pedagogy, and evaluation) at three levels of expertise (i.e., novice, proficient, and expert). She recommended that programs for pre-service teachers' education consider: 1) developing online language-teaching stills through existing courses; 2) developing online teaching skills at different levels of expertise and responsibilities for different roles; 3) revamping existing technology training; and 4) implementing early virtual field experiences and virtual practicums. Comas-Quinn (2011), meanwhile, explored how in-service teachers were impacted by the introduction of blended learning into online language courses. Based on a survey and interviews, the author reported

that teachers understood the pedagogical use of new technology, which was essentially aligned with TPACK (Mishra & Koehler, 2006).

When providing training to online world-language teachers, in addition to introducing them to information and communication technology (ICT) and how to use it, it is especially important to guide them to think actively about *how to be* online teachers, rather than passively learning the mechanics of the role. In other words, teachers must not only acquire ICT skills, but also acknowledge the critical importance of their own acceptance of and adaptation to the new pedagogical environment.

Concerning the importance of using technologies suitable to various levels of language learning, Hampel and Stickler (2005) viewed language teaching as a cumulative process, and proposed a skill pyramid with (from bottom to top) seven key competencies: 1) basic ICT competence, 2) technical competence with specific software, 3) ability to deal with the constraints and possibilities of the medium, 4) online socialization, 5) facilitating communicative competence, 6) creativity and choice, and 7) own style. Together, these key competencies illustrate the specific skills that teachers of e-learning courses ideally should have, in the spheres of technology, language knowledge, and the cognitive needs of both the teacher and the learners.

To sum up, research on teaching and teacher education for online world-language courses is still in its infancy. In terms of teaching practices, online instructors appear likely to employ a higher proportion of non-content-related practices. In addition, interactions in multiple modalities are key to improving students' satisfaction and sense of belonging. In terms of teacher education, several early experimental interventions reported improvements in language-teachers' online-teaching skills and confidence, but more research will be needed if we are to understand what components of teacher education and PD are most effective in this area. Regarding technology and teaching skills, several frameworks for online world-language teaching have been proposed, and consistently highlight that merely having technology skills is not sufficient. Rather, understanding how technology can be used for online teaching should be considered a core skill for online instructors.

## *5. Implications*

The prior sections have provided a comprehensive thematic review of the existing scholarship on online world-language courses, including their effectiveness, the factors that predict their students' learning outcomes, and the issues they raise for teaching and teacher education. Based on this review, implications for policy, practice, and future research are provided below.

### *5.1 Implications for Policy and Practice*

Delivering a language course online requires more than simply digitizing current teaching materials and posting them on the Web, or teaching in the same way as in face-to-face settings (Zhang, 2014). Hampel and Hauck (2004) proposed five components that language learners should be provided within computer-mediated learning environments: 1) opportunities for interaction to negotiate meaning; 2) opportunities to hear or read modified comprehensible input; 3) opportunities to produce or write modified comprehensible output; 4) input that allows for a focus on target features of the second language; and 5) a rich context in which the second language facilitates comprehensible input. All five can also be applied to online language learning. As Oliver et al. (2012) noted, good online teaching is more than modeling language output and providing feedback on student work, and socialization and communication are vital to it.

On a macro level, Zhang (2014) concluded that a good online language-course design must be 1) interactive, 2) constructive, 3) intentional, 4) authentic, and 5) cooperative. On a micro level, designing online tasks and activities that can promote interaction is critical, as the literature suggests that a task-based approach normally leads to better learning outcomes than a form-focused one (Blake, 2016). Online materials and tasks should be carefully designed to avoid cognitive overload (Stickler & Shi, 2013) and to promote learner-instructor and learner-content interactions (Lin, Zheng, et al., 2017). Best practices for increasing students' engagement with online content include designing materials based on students' interests and utilizing student-centered practices (DiPietro, Ferdig, Black, & Presto, 2010).

In addition to making pedagogical improvements in course- and task design, online teachers should prepare their students for online interaction, as this will make speaking practice and instruction in the online environment more efficient (Stickler & Shi, 2013). Moreover, given the critical importance of self-regulation in online language learning (Lin, Zhang, et al., 2017), online instruction should help to develop students' self-regulation skills. Chang (2007) demonstrated that the use of just one self-regulatory strategy (i.e., self-monitoring of one's progress towards learning goals) resulted in better online language-learning outcomes.

Providing support and training for online language teachers is essential (Blake, 2016; Lin & Zheng, 2015; Stickler & Shi, 2013), and not only to their development of technological knowledge for online instruction (Cheng, 2017). Lin and Zheng (2015) found that the PD online world-language teachers most needed did not match the PD they actually received. Some high-demand areas, such as accommodating different learning styles and language-based technology integration, should be given much more attention by PD planners and providers.

### *5.2 Implications for Research*

Based on the foregoing research synthesis, several directions for future research can be recommended. First, given the literature's mixed findings on effectiveness, future studies should use research methods other than experimental designs to clarify whether and why online world-language students have lower achievement and/or less positive attitudes than those who take other subjects online, or who take world-language courses in face-to-face settings.

Second, in addition to final grades, Swan (2003) urged researchers to consider alternative measures of learning outcomes. Thus far, such alternative measures have included satisfaction, perceived progress, and students' attitudes (Lin, Zhang, et al., 2017; Lin, Zheng, et al., 2017; Oliver et al., 2012). Given that students' progress in online language courses is not necessarily reflected in final grades or in all four language skills (Blake, 2000, 2011; Lin, Warschauer, & Blake, 2016), it may be helpful to examine improvement in listening, speaking, reading, and writing separately. In addition to these four skills, other aspects of progress, such as identity construction and development, socialization, and pragmatics knowledge, should also be considered as outcomes of online world-language learning (for a review, see Lin et al., 2016).

Third, in terms of factors predicting online language-learning outcomes, the literature has thus far only focused on self-regulation (i.e., motivation and learning strategies) and interaction types (i.e., learner-learner, learner-content, and learner-instructor interactions; see Moore, 1989). Accordingly, future research should consider other individual-level variables such as gender, ethnicity, aptitude, and prior experience of online learning; and contextual factors such as parental involvement, family socioeconomic status, access to computers, availability of mentoring, and online class sizes.

Fourth, though prior studies have identified best practices for online courses (DiPietro et al., 2010), work on best practices for online world-language courses remains limited; and there has been almost no exploration of the relationship between students' learning outcomes and the teachers' use of different practices (e.g., content-related vs. non-content related teaching practice: see Lin and Zheng, 2015). Future researchers are therefore encouraged to investigate whether particular teaching practices promote student learning in online world-language learning contexts.

Lastly, more research grounded in theoretical models with robust research designs is urgently needed. Research on online learning in higher education utilizing the Community of Inquiry (CoI) framework proposed by Garrison, Anderson, and Archer (2001) has confirmed CoI's value in explaining how learners construct knowledge. Thus, using CoI may help to further our understanding of how online instructors' teaching and social presence may affect students' knowledge construction.

## *6. Conclusions*

With an ever-growing number of K-12 students taking online courses, it is important to ensure the effectiveness of all types of online teaching. However, this review has clearly indicated that online world-language learning in K-12 settings is under-researched and under-theorized. First, our review of the effectiveness of online world-language courses found that they appear to face larger challenges than online courses in other subject areas, in terms of both learning outcomes

and satisfaction. This chapter also reviewed factors that may contribute to the success of online language learning, and concluded that the existing literature has mainly focused on just two (i.e., self-regulated learning and interaction), often to the exclusion of teacher-level factors. Those few studies that have looked at online world-language teachers indicate that, while such teachers' technology skills for online teaching are important, such skills are separate from – and less important than – their technological pedagogy skills, which enable effective integration of technology into the online curriculum.

This chapter's findings have significant implications for both practice and research. With regard to the former, they imply that online world-language courses should be designed with a view to improving student engagement and interaction. In addition, the current state of PD for online world-language teachers appears to be insufficient in both technology use and pedagogical design. It is recommended that future studies adopt a wider range of both quantitative and qualitative methods to examine online world-language courses from a broader set of perspectives, including not only final academic achievement but also formative assessments that may better capture students' language-skills gains. More studies of teacher education are also needed, to provide more evidentiary support for best teaching practices in online world-language courses.

*References*

Alison, M., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses, and red herrings? *The Modern Language Journal*, *82*(3), 338–356. https://doi.org/10.2307/329960

Bailey, C. J., & Card, K. A. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. *The Internet and Higher Education*, *12*, 152–155. http://doi.org/10.1016/j.iheduc.2009.08.002

Barbour, M. K., & Reeves, T. C. (2009). The reality of virtual schools: A review of the literature. *Computers & Education*, *52*, 402–416. https://doi.org/10.1016/j.compedu.2008.09.009

Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O., & Lai, S.-L. (2009). Measuring self-regulation in online and blended learning environments. *The Internet and Higher Education*, *12*, 1–6. https://doi.org/10.1016/j.iheduc.2008.10.005

Blake, R. J. (2000). Computer mediated communication: A window on L2 Spanish interlanguage. *Language Learning & Technology*, *4*(1), 120–136. Retrieved from http://llt.msu.edu/vol4num1/blake/default.html

Blake, R. J. (2008). Distance education for second and foreign language learning. In S. Thorne & S. May (Eds.), *Language and Technology* (pp. 1–12). New York: Springer. https://doi.org/10.1007/978-3-319-02328-1_13-1

Blake, R. J. (2011). Current trends in online language learning. *Annual Review of Applied Linguistics*, *31*, 19–35. https://doi.org/10.1017/S026719051100002X

Cavanaugh, C. (2001). The effectiveness of interactive distance education technologies in K-12 learning: A meta-analysis. *International Journal of Educational Telecommunications*, 7(1), 73-88.

Chang, M.-M. (2007). Enhancing web-based language learning through self-monitoring. *Journal of Computer Assisted Learning*, *23*(3), 187–196. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2729.2006.00203.x/full

Cheng, H.-J. (2017). A TL-TPACK model on CSL pre-service teachers' competencies of online instruction. In C.-H. Lin, D. Zhang, & B. Zheng (Eds)., *Preparing foreign language teachers for next-generation education* (pp. 198–225). Hershey, PA: IGI Global. https://doi.org/10.4018/978-1-5225-0483-2.ch011

Comas-Quinn, A. (2011). Learning to teach online or learning to become an online teacher: An exploration of teachers' experiences in a blended learning course. *ReCALL*, *23*, 218–232. https://doi.org/10.1017/S0958344011000152

Compton, L. K. L. (2009). Preparing language teachers to teach language online: A look at skills, roles, and responsibilities. *Computer Assisted Language Learning*, *22*, 73–99. https://doi.org/10.1080/09588220802613831

DiPietro, M., Ferdig, R., Black, E., & Presto, M. (2010). Best practices in teaching K-12 online: Lessons learned from Michigan virtual school teachers. *Journal of Interactive Online Learning*, *9*(3), 10-35.

Freidhoff, J. (2017). *Michigan's K-12 virtual learning effectiveness report 2015-2016*. Lansing, MI: Michigan Virtual University.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, *15*(1), 7–23. doi:10.1080/08923640109527071

Hampel, R., & Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. *Language Learning & Technology*, *8*, 66-82. Retrieved from http://llt.msu.edu/vol8num1/hampel/

Hampel, R., & Stickler, U. (2005). New skills for new classrooms: Training tutors to teach languages online. *Computer Assisted Language Learning*, *18*, 311–326. https://doi.org/10.1080/09588220500335455

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.

Ho, C. M. L., Rappa, N. A., & Chee, Y. S. (2009). Designing and implementing virtual enactive role-play and structured argumentation: promises and pitfalls. *Computer Assisted Language Learning*, *22*, 381–408. https://doi.org/10.1080/09588220903184732

Jabeen, S. S., & Thomas, A. J. (2015). Effectiveness of online language learning. In *Proceedings of the World Congress on Engineering and Computer Science* (Vol. 1). WCECS 2015. Retrieved from http://www.iaeng.org/publication/WCECS2015/WCECS2015_pp297-301.pdf

Lantolf, J. P. (2006). Sociocultural theory and L2: State of the art. *Studies in Second Language Acquisition*, *28*, 67–109. https://doi.org/10.1017/S0272263106060037

Lantolf, J. P., & Thorne, S. L. (2008). Sociocultural theory and second language learning. In B. VanPatten & J. Williams (Eds.), *Theories in second language acquisition: An introduction*. Pp. 197-220. New York: Routledge.

Lin, C.-H., & Warschauer, M. (2015). Online foreign language education: What are the proficiency outcomes? *The Modern Language Journal*, *99*, 394–397. https://doi.org/10.1111/modl.12234_1

Lin, C.-H., & Zheng, B. (2015). Teaching practices and teacher perceptions in online world language courses. *Journal of Online Learning Research*, *1*(3), 275–303. Retrieved from https://www.learntechlib.org/d/171055

Lin, C.-H., Warschauer, M., & Blake, R. J. (2016). Language learning through social networks: Perceptions and reality. *Language Learning & Technology*,*20*, 124-147.

Lin, C.-H., Zhang, Y., & Zheng, B. (2017). The roles of learning strategies and motivation in online language learning: A structural equation modeling analysis. *Computers & Education*, *113*, 75–85. https://doi.org/10.1016/j.compedu.2017.05.014

Lin, C.-H., Zheng, B., & Zhang, Y. (2017). Interactions and learning outcomes in online language courses. *British Journal of Educational Technology*, *48*, 730–748. https://doi.org/10.1111/bjet.12457

Lin, T.-J. L., & Lan, Y.-J. L. (2015). Language learning in virtual reality environments: Past, present, and future. *Journal of Educational Technology & Society*, *18*, 486–497. Retrieved from http://www.jstor.org/stable/jeductechsoci.18.4.486

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record*, *115*(3), 1–47.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*, 1017–1054.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education*, *3*(2), 1–6.

Oliver, K., Kellogg, S., & Patel, R. (2012). An investigation into reported differences between online foreign language instruction and other subject areas in a virtual school. *CJEM*, *29*(2), 269–296. Retrieved from http://www.equinoxpub.com/journals/index.php/CALICO/article/view/23732

Rankin, Y. A., Gold, R., & Gooch, B. (2006). 3D role-playing games as language learning tools. *Eurographics*, *25*(3), 1-6.

Stickler, U., & Shi, L. (2013). Supporting Chinese speaking skills online. *System*, *41*(1), 50–69. https://doi.org/10.1016/j.system.2012.12.001

Suh, S., Kim, S. W., & Kim, N. J. (2010). Effectiveness of MMORPG-based instruction in elementary English education in Korea. *Journal of Computer Assisted Learning*, *26*, 370–378. https://doi.org/10.1111/j.1365-2729.2010.00353.x/full

Swan, K. (2003). Learning effectiveness online: What the research tells us. In J. Bourne & J. C. Moore (Eds), *Elements of Quality Online Education, Practice and Direction*. Needham, MA: Sloan Center for Online Education, 13–45.

Tseng, M.-F. (2017). The development of skills required for online Chinese language teaching. *Journal of Technology and Chinese Language Teaching*, *8*(1), 36-55. Retrieved from http://www.tclt.us/journal/2017v8n1/tseng.pdf

Watson, J., Pape, L., Murin, A., Gemin, B., & Vashaw, L. (2015). *Keeping pace with K-12 digital learning: An annual review of policy and practice*. Retrieved from http://www.kpk12.com/wp-content/uploads/Evergreen_KeepingPace_2015.pdf

Zandberg, I., & Lewis, L. (2008). Technology-based distance education courses for public elementary and secondary school students: 2002-03 and 2004-05. Statistical Analysis Report. NCES 2008-008. *National Center for Education Statistics*. Retrieved from http://eric.ed.gov/?id=ED501788

Zhang, S. (2014). An evidence-based practical guide to designing and developing Chinese-as-a-foreign-language (CFL) courses online. *International Journal of Technology in Teaching and Learning*, *10*(1), 52–71. Retrieved from https://works.bepress.com/shenglan_zhang/1/

Zheng, D., Young, M. F., Brewer, R. A., & Wagner, M. (2009). Attitude and self-efficacy change: English language learning in virtual worlds. *CALICO Journal*, *27*(1), 205–231. Retrieved from http://www.jstor.org/stable/calicojournal.27.1.205

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2