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Multilingualism and E-learning

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INTRODUCTION

To understand the rapid growth of multilingualism in the world today, this chapter takes a close look at the new language policies that chart linguistic goals and aspirations for its citizens as well as exploring the forces of transnationalism that propel the spread of languages. No doubt, multilingualism today requires us to look from the standpoint of nations and their language policies. Nations engage not only in status planning by designating a given language as an official/national language but, more importantly, they engage in acquisition planning (cf. Cooper, 1989). Acquisition planning pertains to policy making about users (as opposed to languages) that specifies overt goals such as those for foreign/second language learning, language revival or interlingual communication (Cooper, 1989). Nations too design policies, albeit not always overt, directed at managing multilingualism in the interest of the nation state, as in the cases of China and Korea discussed below.

At the same time, conscious policies are not the sole cause for the growth of multilingualism today. A second major force is transnationalism, which necessitates a common language (or languages). For many English users, speaking the *world language* confers global citizenship. There exist clusters of issues within transnationalism that affect language and the growth of multilingualism. These clusters include scientific and technological endeavors and world culture; the migration of industry and internationalization of the workplace; and the disruption of the coinciding of ethnicity and nation via migration (Brutt-Griffler, 2006).

A recent analysis of the spread of major national languages shows that multilingualism represented by the spread of national or would-be *national languages* (i.e. local lingua francas) constitutes one of the largest forms of multilingualism (Brutt-Griffler, 2010). Spolsky (2012), for instance, provides a comprehensive account of a set of variables and language policy outcomes in a variety of geopolitical contexts. The chapter situates multilingualism in the context of national/transnational language policy initiatives and transnationalism and aligns it with educational initiatives in the domain of the use of technologies and new media (e-learning). It provides a broad discussion of research on the impact and effectiveness of e-learning in promoting multilingualism. From the standpoint of educational policies, we observe a worldwide trend towards introducing foreign/second language education earlier in school systems with the goal of developing advanced levels of proficiency in two or more languages and the concern to give access to linguistic resources to populations across the various occupational domains. Today, knowledge economies rely more heavily on intellectual capabilities than on physical inputs. They are economies where knowledge and education, often referred to as 'human capital', are both a product and a productive asset (cf. Powell and Snellman, 2004). The emphasis is on the skills of innovation, creativity, digital technology and new means of communication (Sanchez, 2003; World Bank Institute, 2001). Grin (2006) makes a direct link between economics and language by applying models of economics to provide useful data for language policy makers to guide them in decision making.

Without a doubt, multilingualism and e-learning are an integral part of one's ability to participate in the global knowledge economy. Perhaps the most visible manifestation of this relationship is still in English language learning, which has seen an explosion of web technologies and new media use worldwide.

This chapter shows that the potential of new technologies and e-learning has been embraced by a sizeable number of language educators working with language learners at the college level as well as by those who work in K-12 contexts. It has gained institutional support in English-speaking countries such as the USA and the UK, as well as Korea and China among many others. While underscoring the advantages of e-learning in language learning, the chapter finds the need for a rigorous empirical investigation of the points of intersection between language learning and e-learning. Such an investigation needs to go beyond the exploration of the benefits and potential of technology. It needs to employ objective learning outcome measures with clear reliability and validity, and methodologies that yield results generalizable across many studies (cf. Ricento, 2006; US Department of Education, 2010). Towards this end, Johnson (2013) provides a useful discussion and a framework for language policy research by outlining contexts, data collection and analysis techniques.

NATIONAL LANGUAGE POLICY: LANGUAGE ACQUISITION PLANNING

At the national level, language policy decision-making processes aim to influence specific *behaviors* and calls for specific *effects* for a given group of *people* (Cooper, 1989: 98; Johnson, 2013). Korea serves as a good recent example of such national language policy making, one that is oriented towards promotion of its national language and the knowledge of English. Korea's language policy puts heavy emphasis on learning English as a global language. The 2007 National Curriculum for English acknowledges the important role of English 'in the communication and bonding between people of different native languages' in a multilingual world as a means 'to be able to understand and communicate knowledge and information' required to foster 'leadership as a cosmopolitan citizen' (Republic of Korea Ministry of Education and Human Resources Department, 2007: 5).

According to Article 23-2 of the Elementary and Secondary Education Law, the 2009 revision of School Curriculum of the Republic of Korea, which takes effect in phases from 2011 to 2013 across grade levels, requires that English as part of a subject cluster be taught from Grade 3 and that information and communication technologies (ICT) education and Chinese characters and classics education be conducted as part of *creative experiential learning* in primary education. In secondary schools, English continues to be taught as a subject. Information, Chinese characters and classics, and other 'everyday foreign languages' – German, French, Spanish, Chinese, Japanese, Russian and Arabic – are included as elective subjects for middle school; with English being one of the three basic subjects together with the Korean language and mathematics for the general high school curriculum, technology, a second foreign language, and Chinese characters and classics are included as regular subjects; additionally, high schools for foreign language specialized education 'must organize 60% or more of the total specialized curriculum units for majoring foreign languages, and organize the specialized curriculum for two foreign languages, including the language of the major' (Republic of Korea Ministry of Education, Science and Technology, 2009: 29).

Envisioning a 'globalization of education, science, and technology' as part of major government policies (Republic of Korea Ministry of Education, Science and Technology, 2011), the Korean Ministry has also developed digital textbooks, provided a customized *Cyber Home Learning System* with 2.9 million subscribers and about 330,000 daily users in 2010, and has led global partnerships through e-learning (Republic of Korea Ministry of Education, n.d.). National programs to promote communicative competence in English, cultural exchange, and innovative teaching methods include the *English Program in Korea* (EPIK) and *Teach and Learn in Korea* (TaLK). In the years 2008–13,

more than 13,000 native-English-speaking multinational EPIK teachers and over 3,000 TaLK scholars were recruited or awarded to teach English in primary and secondary schools (National Institute for International Education, n.d.).

China serves as another good example to understand multilingualism in the world today. English is well entrenched in both school and university curricula and has established itself as a major second language alongside the official language. Similarly to Korea, learning English in China leads to the development of societal bilingualism/multilingualism, with national policies protecting the role of the national language. Thus, in cases like these, English does not replace the national language but rather promotes bilingualism (Brutt-Griffler, 2002). The language policy to promote the official language, Mandarin Chinese, has contributed to building national identity and reducing illiteracy in China with 55 minority groups who speak more than 120 minority languages (Wang and Phillion, 2009). A clash due to the relationship between national language policies and ethnic minority identity is notable in such provinces as Tibet (Nelson, 2005) and also in the geopolitical diaspora (Hua and Wei, 2014), although the Regional Autonomy Law for Minority Nationalities enacted in 1984 allows minority languages to be used as languages of instruction (Zhou, 2004), as part of the 17 responsibilities of the Ministry of Education (n.d.) that also include promoting scientific and technological innovation in higher education and Chinese as a national and global language; the policies for the latter are implemented by the Chinese National Office for Teaching Chinese as a Foreign Language, referred to as *Hanban*, through the Confucius Institutes and Classrooms network around the world (Hua and Wei, 2014).

Even if we look at smaller nations, such as the Philippines, which, at one point, by policy design, was to become an English-speaking nation (see Brutt-Griffler, 2002), such a plan today can only be seen as an error. The Philippines, with its constitutional Filipino-and-English Bilingual Education Policy, implemented a multilingual education policy, *Mother Tongue-Based-Multilingual Language Education* (MTB-MLE), in all public schools, starting in the 2012–13 academic year (Republic of the Philippines Department of Education, 2012). Eight major languages and six others spoken by indigenous children are offered as a learning area and also as a medium of instruction in Kindergarten to Grade 3 in the basic education program. The implementation of this MTB-MLE policy was grounded in empirically evidenced positive outcomes of multilingualism among young learners with respect to their language competence development, cognitive development and academic achievement (Besa, 2014).

The notion that 'the one language-one nation ideology of language policy and national identity is no longer the only available one worldwide' (Hornberger, 2002: 29) is well attested by the member states of the European Union. The Council of Europe has provided guidance to member states to

promote linguistic diversity, pluralism and educational practices to promote the learning of multiple languages. It views language skills as 'essential if individuals are to benefit from opportunities in employment and mobility' (2014: 5) and it holds that 'they are necessary to participate actively in the social and political processes which are an integral part of democratic citizenship' (2014: 5). The most recent survey by the Council of Europe shows that an increasing number of EU member states require adult migrants to display a requisite degree of language proficiency to legally secure pre-entry to the country (9 countries), a residence permit (22 member states) and to obtain citizenship (26 member states) (Council of Europe, 2014). Additionally, the diverse populations of students attending schools across Europe are served by the new directive adopted in April 2014 by the Committee of Ministers and directed to member states with respect to 'the importance of competences in the language(s) of schooling for equity and quality in education and for educational success'. It recommends that the governments of member states implement and provide opportunities 'for all to acquire competences in the language(s) of schooling which are necessary for their success in the various school subjects'. It is a major recognition of the importance of language education among learners for whom 'the acquisition of competences in the language of schooling is a major challenge'. For many nation states, 'the language(s) of schooling' will be a process of aligning states' educational policies with official/national language policies. The directive defines 'language of schooling' as 'the language used for teaching the various school subjects and for the functioning of schools. This language is usually the official language(s) of the state or the region, for example Polish in Poland or Italian in Italy, but may also concern officially recognized regional or minority languages, foreign or migrant languages.' This new directive to the governments of the EU member states has the potential to strengthen national/official languages; at the same time, it creates new requirements of the provisions, methodology and delivery systems (such as e-learning) for all students to develop bi- or multilingual language competence.

E-LEARNING AND LANGUAGE DEVELOPMENT

The underlying principle in e-learning pedagogy is that technology is a means to an end, not an end in itself. Accordingly, the instructor creates and applies e-learning strategies and resources in teaching and engages students in different e-learning activities. As a delivery system of student-centered, any time–any place learning, e-learning pedagogy, research has shown, increases students' opportunities to interact with content area, promotes communication and collaboration, and adds a worldwide dimension to learning (Waterhouse, 2005). Scholars rely on the premise that e-learning enhances teaching and learning

outcomes. Waterhouse, whose career in technology-enhanced teaching and consultancy spans over 30 years, identifies the following strengths of e-learning:

- E-learning facilitates student-centered learning.
- E-learning facilitates any time–any place learning.
- E-learning facilitates student interaction with course content.
- E-learning facilitates and promotes communication and collaboration.
- E-learning makes course administration easier.
- E-learning helps track students' *time* on task.
- E-learning can reduce the cost of delivering instruction.
- E-learning adds a worldwide dimension to courses.

(Waterhouse, 2005: 10)

While stressing the positive outcomes of the e-learning environment, Waterhouse (2005) underscores the importance of applying appropriate *e-learning* pedagogy. She emphasizes that 'e-learning improves learning when instructors focus first on the fundamentals of teaching and learning – that is, *on pedagogical principles* – rather than on e-learning technology' (2005: 3, our italics). That is, technology is a means to effective learning and teaching and not an end in itself. For Waterhouse, *e-learning pedagogy* involves 'the pedagogical principles and related instructional strategies applicable to an e-learning environment' (2005: 4). This will include the instructor's understanding of how to create an *e-learning resource, an activity*, and an *e-learning strategy*. The development of Learning Management Systems (LMS) such as Blackboard or WebCT has allowed instructors to construct a *course site* without requiring advanced programming skills. According to Waterhouse (2005), LMSs play a crucial role in the e-learning environment and e-learning pedagogy. LMS functionality extends to four domains (2005: 8):

- distribution of course information
- student–instructor and student–student communications
- student interaction with course resources
- online testing and grading.

Waterhouse's underscoring of *e-learning pedagogy* is particularly important given that scholars have put forth numerous definitions and conceptualizations of what is actually subsumed under *e-learning*. Pedagogical principles would therefore sensibly make the e-learning environment cohere.

From the educational standpoint, the strong advocacy for e-learning comes with calls for teachers to 'innovate' and develop effective and appropriate pedagogies. Garrison and Anderson (2003) point out that educational aspects of e-learning fit well with the communicative potential of new technologies and constructivist theories of learning.

In the area of language learning, the fast-paced development of information and communication technologies (ICT) since the 1990s and language learners'

access to it have facilitated different forms of web-based learning where much communication and interaction takes place in a virtual classroom. By the middle of the 1990s, the Internet introduced new forms of e-learning.

Language educators underscore the following advantages of e-learning in language education:

- exposure to 'authentic' target language
- access to wider sources of information and varieties of language
- opportunities to communicate with the outside world and native speakers
- a learner-centered, task-based approach
- development of learner autonomy
- learning *in* different locations *and* institutions
- working at different rates and levels.

(Directorate General of Education and Culture of the European Union, 2006: 19–21)

Research on how technology can enhance the development of specific language skills shows unequal attention to the four language skills. Most of the research studies have focused on the use of technology in writing and reading development; much less research has been carried out to address listening and speaking skills (Liu et al., 2002).

Writing

A sizeable number of studies have addressed the development of specific writing skills such as grammatical accuracy (Gonzalez-Bueno and Perez, 2000), error feedback (Ogata et al., 2000) and the writing process (Thorson, 2000). Much research in the second language writing domain also focuses on the development of written communication skills using synchronous and asynchronous communication tools. Computer-mediated communication (CMC) studies, for example, highlight the benefits of:

- equal and increased participation among students when compared to classes that use face-to-face communication (Blake, 2000)
- the use of a wider range of discourse functions (Cubillos, 1998; Sotillo, 2000)
- greater opportunity for individualized instruction when using technology (Liu et al., 2002).

Recent studies on writing and grammar show the implementation of an extended range of 'network-based language teaching and learning' (Kern and Warschauer, 2000) that include web-based, automated proofing software (Chodorow et al., 2010), corpora (Frankenberg-Garcia, 2014), Web 2.0 technologies such as wikis (Mak and Coniam, 2008), blogs (Shin, 2014) and Google Docs (Strobl, 2014), Facebook (Wang and Vasquez, 2014), web-based mobile applications (Li and Hegelheimer, 2013) and virtual worlds (Kruk, 2014).

Positive outcomes of e-learning for writing and grammar reported in the recent studies include learner benefits as follows:

- Corrections with alternatives suggested by an automated scoring software can aid the user in making an informed decision (Chodorow et al., 2010).
- Using corpus examples yields linguistic and cognitive benefits in comprehension and production (Frankenberg-Garcia, 2014).
- Wiki writers produce more text, strengthen the sense of community and grow confidence in writing (Mak and Coniam, 2008).
- Blogging facilitates emergent knowledge of the interpersonal function of text and the interrelation between interpersonal and experiential functions (Shin, 2014).
- Mobile users show improvement on a grammar post-test, self-editing corrections and errors in final drafts (Li and Hegelheimer, 2013).
- Facebook seems to provide an alternative pedagogical environment where users produce more writing (Wang and Vasquez, 2014).

E-learning studies also report challenges and provide pedagogical recommendations for specific learning environments. For example, the complexity of an e-learning peer response blog activity may not guarantee peer writers' revisions (Liang, 2010); novice wiki writers may not feel comfortable with editing peers' writing and may also doubt the accuracy of peer editing (Castaneda and Cho, 2013). Teachers' modeling and scaffolding support are crucial to facilitating novice writers' learning process (Liang, 2010).

As seen in the growing number of empirical studies on e-learning in writing, the advancement of ICT yields dramatic changes in tools for writing, which challenges the traditional notion of what writing is on the one hand, and, on the other hand, aids that advanced teaching and learning of writing through network-based tools (Warschauer, 2010). *Digital literacies* – 'the practices of communicating, relating, thinking and "being" associated with digital media' (Jones and Hafner, 2012) – have become the routine social practice of ordinary people – the 'digital natives' (Prensky, 2001) – of the new times. The societal trend prompts writing pedagogies to embed digital literacies in classroom practices – in other words, to include digital composition within the language curriculum. Through increased opportunity to produce language and through multimodal semiotic resources to socially construct meaning (Kern and Warschauer, 2000), a well-designed, project-based language pedagogy may also enhance critical literacies, multimodal composition, visual literacy, technological skills, collaboration, autonomous learning and authentic audience awareness (Hafner and Miller, 2011).

Moreover, the advancement in e-learning technologies affords additional resources for assessment, which may also facilitate teaching and learning processes. For example, automated writing evaluation programs that provide model essays, scoring rubrics, graphic organizers, word banks, dictionaries, thesauri and spelling/grammar/usage checkers, not merely automated scores, are shown to increase the amount of teacher feedback given to students (Warschauer, 2010).

Reading

Reading has received less research attention when compared to writing. Within this domain, research has focused on the acquisition of lexicon and the use of glossing aids that help the reader comprehend unknown phrases and words. There is some evidence to suggest that technology-supported glossing formats help develop reading proficiency (Lomicka, 1998; Nagata, 1999), and multimedia technology significantly enhances vocabulary learning (Grace, 2000). Also, a recent meta-analysis of 28 study reports on first language (L1) glosses based on reported effect sizes and *p*-values shows that computer-assisted language learning (CALL) L1 glossing is significantly more effective in L2 reading than paper-based L1 glossing (Taylor, 2013).

Recent lexicon studies add positive empirical evidence of e-learning technologies and environments on the development of reading and vocabulary. The new tools for reading include mobile phones (Lan et al., 2013), an intelligent web-based instruction system (Jia et al., 2013) and digital gaming (Hitosugi et al., 2014). Other studies examine learners' use of reading strategies in e-learning environments such as an online strategy training site (Huang, 2013) and a web tutorial module (Urlaub, 2013). In addition to the learning outcome, studies on reading domain shed insights that may aid e-learning pedagogies for reading as follows:

- Individual characteristics including learners' proficiency levels affect e-learning. Explicit strategy training may help low-proficiency learners to use useful strategies – *global* strategies such as keyword, preview, prediction, and outline – that are preferred and used heavily by high-proficiency peers (Huang, 2013).
- Sociocultural backgrounds influence e-learning. It is imperative to understand and accommodate learners' cultural beliefs about language learning and to design incremental, short-term goals of tasks aligned with long-term objectives (Juffs and Friedline, 2014).
- Factors including cost burden, inconvenient interface and availability of a familiar alternative hinder learners' engagement with mobile activities. Integrating an interactive function, a reward-based scheme and a tracking mechanism, and connecting with other learning activities may heighten learners' willingness to engage in mobile-assisted language learning (Stockwell, 2010).

As the transition to e-reading accelerates with the advent of new technologies – smartphones, tablets and e-readers – and the new media affords increasing opportunities to read *and* write online, the digital era sees a closer connection between reading and writing domains (Warschauer et al., 2013). For example, a scaffolded e-reading intervention study with sixth graders (Park et al., 2013) finds positive outcomes in the English Language Arts California Standards Test including Word Analysis, Writing Strategies and Writing Conventions subtests.

Speaking

In Liu et al.'s (2002) review of research, only six of 70 studies investigated how technology promotes speaking. Liaw's (1997) and Derwing et al.'s (2000)

studies are worth noting. Liaw (1997) focused on using computer books and investigated the dialogue that took place among the students discussing them. The study notes that for meaningful discussions to take place students need to have something to talk about. It is argued that computer books could provide the content and stimulus to promote the development of speaking skills. Derwing et al. (2000), on the other hand, address the use of speech recognition software and its potential to call attention to learners' production errors. Derwing et al., however, caution that the software's feedback on non-native speaker utterance may not always be reliable.

Despite the fact that fewer studies have investigated speaking in the e-learning environment than studies on writing and reading competences, a recent review (Golonka et al., 2014) of more than 350 select empirical studies that examined the role of technology use in foreign language learning finds the only strong support for effectiveness in the studies with chat and with automatic speech recognition software, the latter of which has, however, still shown mixed results, in particular with low correlations between the software scores and the human scores. Other e-learning technologies integrated to promote speaking include asynchronous (Hirotani and Lyddon, 2013) and synchronous video-web communication (Canto et al., 2013), virtual worlds (*Second Life* in Canto et al., 2013), text-based CMC tools (*WebCT Chat* and *WebCT Bulletin Board* in Razagifard, 2013) and iPads (Lys, 2013).

A brief summary of evidenced learner benefits of improved speaking when learners use the e-learning tools follows:

- iPad users produced longer speech samples with increased task and linguistic complexity despite fluctuating fluency (Lys, 2013).
- Chat promoted second language (L2) oral fluency in terms of mean length of pauses, articulation rate, fluency runs, phonation-time ratio and speech rate (Razagifard, 2013).
- Learners who interacted with expert peers through video-web communication and virtual worlds outperformed peers who worked in the traditional classroom, in their oral communicative growth (Canto et al., 2013).
- Online exchange through asynchronous videoconferencing helped learners produce more elaborate discourse, still with no improvement in syntactic complexity (Hirotani and Lyddon, 2013).

Listening

Relatively few research studies have focused on the development of listening. Leloup and Ponterio argue that 'The multimedia capabilities of CALL enable learners to engage in a complex listening experience, complete with visual cues from the interlocutor' (2003: 2). They point out that the biggest advantage that the research on listening has identified is that 'the multimedia nature of the activities addresses the use of different modalities, thus appealing to a wider variety of learning styles' (2003: 2).

A few recent studies on listening contribute to e-learning pedagogical practices and resources. In his auditory perception High Variability Phonetic Training, Thomson (2012) finds that users improved their L2 vowel learning and confidence but the gain was not maintained a month after training was completed and urges that ongoing training be provided to ensure learners' continued improvement. Leveridge and Yang's research (2013) with 141 Taiwanese high school learners of English as a foreign language (EFL) suggests that the caption reliance test is a potential resource for teachers to identify different needs for caption and make informed decisions, based on the finding that shows students' variable use of captions according to their listening comprehension levels. Also, as a way to help reduce listeners' internal anxiety, Chen et al. (2014) encourage teachers to raise students' awareness of affective strategies – which are found to be least frequently used in their listening strategy study with adult EFL learners in China – and to teach them how to use the strategies in an e-learning environment.

Young learners

Although empirical investigations have still been focused more on adult learners, the new era of ICT that demands digital literacies of learners sees a growing number of studies with learners in K-12 schools. Recent studies have produced positive evidence of young learners' development of language competences in e-learning environments that integrate mobile phones (Lan et al., 2013), computer-assisted task-based language instruction (Arslanyilmaz, 2013), corpora (Frankenberg-Garcia, 2014), 3D virtual worlds (Kruk, 2014) and wikis (Mak and Coniam, 2008).

The expansion of research efforts does not only lie in the range of technologies but also in that of learners' age and language backgrounds. For instance, researchers in recent studies worked with English language learners in elementary and high schools in Taiwan (Lan et al., 2013), Poland (Kruk, 2014), Portugal (Frankenberg-Garcia, 2014) and Hong Kong (Mak and Coniam, 2008), and American high school learners of Turkish as a foreign language (Arslanyilmaz, 2013). The trend suggests that English, whether foreign or second, maintains a status as the primary target language under scholarly investigation among this population.

Also noteworthy in the studies with young learners is the positive relationship between e-learning experience and academic achievement found in quasi-experimental studies (Jia et al., 2013; Martin Monje, 2014). For example, the impact of intelligent web-based English instruction with Chinese learners of EFL in four high schools on their regular examination scores was found to be statistically significant (Jia et al., 2013). Factors that may influence the impact include content-oriented design, instant feedback and regular integration of an e-learning system into the regular English language class. Also, Grade 12 Spanish learners of EFL who used Web 2.0 based materials – forums,

collaborative glossaries, social repositories with annotated past papers, social bookmarking, a wiki and a blog – instead of traditional EFL resources, achieved good scores in the English section of the Spanish university admission examination (Martin Monje, 2014).

E-LEARNING AND MULTILINGUAL LANGUAGE DEVELOPMENT: THE CASE OF THE EU

The multilingual orientation tied to the notion of European unity led to the launch of one of the world's most ambitious language learning programs, beginning with an emphasis on the necessity of an 'early start' – 'effective kindergarten and primary school level language education' (Commission of the European Communities, 2003: 7) – also including equal focus on 'a lifetime of language learning'. Key areas of strategic development have included teacher training (including early childhood language education) and the provision of cross-border educational exchange. The EU's language learning action plan claims the following:

> Socrates/Comenius school language projects, in which a class works together with a class abroad, and which culminate in class exchanges, provide young learners with genuine opportunities to use language skills through contact with learners of the same age. All pupils should have the experience of taking part in such a project and in a related language exchange visit. In the same manner, under teacher training, emphasis is put on the necessity of teachers having 'adequate experience of using the target language' – to which end it is suggested that teachers 'should have spent an extended period in a country where that language is spoken and have regular opportunities to update their training'.
>
> (Commission of the European Communities, 2003: 8)

The plan recognizes, however, that, given the prohibitive costs of such programs, ICT is needed to reduce the resource gap. Planners note the impracticality, for instance, of extensive travel and extended stays abroad for language teachers in many contexts, and suggest as an alternative the use of e-learning and distance learning in teacher training. This goal is closely linked to the use of technology to lower the cost of the otherwise prohibitive costs of cross-border educational exchanges. The EU's e-learning program's 'main action' is known as e-Twinning, which electronically links partner schools across national boundaries within the EU. Described as a 'framework for schools to collaborate on the Internet', foreign language education is considered central to the mission of this initiative. E-Twinning is specifically highlighted as 'mak[ing] it possible for all European schools to build pedagogical partnerships with a school elsewhere in Europe, fostering language learning and intercultural dialogue, and promoting awareness of the multilingual and multicultural model of European society'. 'Considerable scope for contact between pupils in other language communities is offered by eLearning approaches based on Internet-facilitated school

twinnings and on the pedagogical use of ICT for learning (eLearning)' (Commission of the European Communities, 2003: 10).

THE E-LEARNING ENVIRONMENT'S IMPACT ON LANGUAGE LEARNING OUTCOMES

The EU Directorate General of Education and Culture commissioned a comprehensive research report entitled *The Impact of Information and Communications Technologies on the Teaching of Foreign Languages and the Role of Teachers of Foreign Languages in Europe*. The group of experts who prepared the report consisted of academics specializing in ICT and foreign language teaching. The steering committee was further supported by a group of practitioners in language education in the seven European countries included in the study. The report examined articles and 'published documentation and forthcoming publications and multimedia' (Directorate General of Education and Culture, 2006: 6) from those EU member states. In addition, it surveyed their Ministries of Education and canvassed the views of 100 experts in the field at the EUROCALL 2002 conference on the future of new media in foreign language teaching and learning. The report includes over 20 case studies as examples of 'quality innovation' and 'best practice' in the field.

The study found that new media play 'an extremely important role' in foreign language teaching, particularly in the area referred to as 'the new literacies (technical, critical, linguistic and cultural)' knowledge (Directorate General of Education and Culture, 2006: 4). It points out that foreign language teaching is 'different' from most other subject areas in the curriculum, namely that it is skill-based as well as knowledge-based, and in this respect it has more in common with Music than, say, History or Geography' (2006: 4). This understanding has implications for the selection of technology that is most appropriate to the language learning and teaching domain. In this respect, language teachers working in a media-rich environment need to develop new literacies (scientific, digital, linguistic, cultural) and ICT competences.

It is not surprising, therefore, that the report underscores the importance of teacher training. It points out that the new media do not automatically lead to a new teaching and learning culture; rather, they offer a new platform for change (Directorate General of Education and Culture, 2006: 9). The report states: 'Teacher training is shown to be the key to the successful introduction and deployment of the new media' (2006: 4). Foreign language teachers need to become aware of their own and their students' changing roles in light of the adoption and use of ICT. The reviewed case studies suggest that 'a shift of paradigm is necessary in teacher/learner roles' (2006: 4). The study recommends that language teachers 'focus on the design of situations, sequences and activities conducive to

learning languages by encouraging learners to participate in collaborative efforts' (2006: 11). The report sums up its findings as follows:

> Co-operative, collaborative procedures are called for to harness the wide range of possibilities the new media offer. Teachers are called upon to abandon traditional roles and act more as guides and mentors, exploring the new media themselves as learners and thus acting as role models for their learners.
>
> (Directorate General of Education and Culture, 2006: 4)

New media environments allow language learners to communicate rather inexpensively and quickly with other learners or native speakers of the target language worldwide. This gives learners unprecedented access to authentic target language input. The EU research report indicates that Europe has a 'satisfactory' state of 'network readiness' and that 'European teachers seem to be overwhelmingly open to technological change'; it states that 'apart from ICT specialists', European teachers are 'the most open to the use of the new media' (Directorate General of Education and Culture, 2006: 5). For instructed foreign language learning, the report (2006: 8) provides a set of practical suggestions for the effective implementation of new media:

- ready access for all learners
- the presence of a full-time technician devoted to servicing and maintaining the functioning of the multimedia laboratory
- the employment of a full-time webmaster
- adequate training for all new teachers and in-service training for others
- meaningful use of the multimedia laboratory classes for intensive practice
- learner-centered approaches to learning
- a total commitment by senior management to the implementation of ICT in language learning classes with vision, support and proactive leadership.

At the same time, the study sums up by stating that the current fascination with technology will give way to 'blended' learning, which will become 'increasingly time and place-independent' (Directorate General of Education and Culture, 2006: 5). It calls for greater attention to be given to a systematic examination of how new media aid language acquisition and learning. It also observes the unequal distribution of the use of ICT in foreign language teaching due to a gender and generation divide and suggests that specific training programs should address it (2006: 5). Recent assessments of multilingual competences among European youth show uneven multilingual competences across EU nations, with English being the first foreign language studied by all within the subject group and showing the highest proficiencies among the main foreign languages offered in the school curricula (see the European Survey on Language Competences Database, available at https://crell.jrc.ec.europa.eu/?q=article/eslc-database, Centre for Research on Education and Lifelong Learning, 2013). The report puts

the emphasis on the importance of teacher professional development, including the use of technology in teaching foreign languages.

E-LEARNING ENVIRONMENT: TEACHER EDUCATION AND PROFESSIONAL DEVELOPMENT

Twenty-first century e-learning involves the use of an increasing variety of innovative technologies including Web 2.0 technologies that feature the promotion of creativity, information sharing and collaboration through the network, which are the very skills that are demanded of language educators and teacher trainers in the era of advancing ICT (ISTE Standards for Teachers, formerly National Educational Technology Standards-Teachers). All teaching practitioners in the digital age should be able to:

- facilitate and inspire student learning and creativity
- design and develop digital age learning experiences and assessments
- model digital age work and learning
- promote and model digital citizenship and responsibility
- engage in professional growth and leadership.

(International Society for Technology in Education, 2007b)

The International Society for Technology in Education (2007a) emphasizes that e-learning educators should aim to design their learning environments to comply with six content-independent standards for all learners living and learning in the digital age: (a) creativity and innovation, (b) communication and collaboration, (c) research and information fluency, (d) critical thinking, problem solving and decision making, (e) digital citizenship, and (f) technology operations and concepts. Accordingly, twenty-first century e-learning should afford opportunities for all learners to accomplish the goals to acquire knowledge, productivity, creativity, communication, research, problem solving, critical thinking and new literacies, in addition to traditional text literacy and numeracy (Egbert et al., 2011).

Moreover, language teachers are expected to be competent in all three areas of content, pedagogy and technology. In other words, educators should have '*technological pedagogical content knowledge*' (Mishra and Koehler, 2006) – a teacher's interactive knowledge base that encompasses knowledge of students, language, culture, language acquisition, fair and equitable learning environments, design of curriculum and planning instruction, assessment, reflection and professionalism (National Board for Professional Teaching Standards, 2010) – in order to provide quality educational experiences that should include much needed learner training (Hubbard, 2013).

Theorizing the knowledge base that teachers need to effectively teach with technology has not reached a consensus and further work is needed on exploring

domain-specific teacher knowledge for technology integration (Voogt et al., 2013). Still, increased attention to utilizing technologies in language teacher education is noted in recent empirical studies with pre- and in-service teachers of diverse world languages – including English, Chinese, Japanese, French, German, Spanish, Ukrainian and Hungarian. Teacher trainees who participated in recent studies in the USA, the UK, France, Finland, Spain, Germany and Korea use blogs, wikis, discussion forums, e-portfolios, YouTube and VoiceThread on mobile devices, Skype, emails, podcasting, videoconferencing, virtual worlds (e.g. *Second Life*) and open educational resources.

Also, notable trends in contemporary teacher education and professional development are the disappearance of national boundaries and international collaborations found in recent research studies, not only in terms of research sites of individual studies and participating teacher trainers with multinational, multilingual backgrounds but also of diverse teacher trainees, which enhance global research efforts towards multilingualism. For example, Dooly and Sadler's two-year telecollaboration study (2013) involved student teachers in Spain and the USA; a three-month-long videoconferencing program (Codreanu and Celik, 2013) included online teacher participants in France, Finland and Spain and online student participants in the USA; and Kitade's research (2014) on Japanese student teachers' professional identity development investigated the developmental trajectory of learners of Japanese located in Korea, China and the USA.

Overall, teacher trainees' e-learning experiences are positive; the results support the claim that networked technologies facilitate teacher development. Key features of well-designed and successfully practiced e-learning for teacher education are summarized as follows:

- Make abstract teacher knowledge concrete as consumers and producers of information (Bustamante and Moeller, 2013).
- Enhance critical thinking, learner autonomy and a sense of belonging to a community of practice (Sardegna and Dugartsyrenova, 2014).
- Promote authentic, situated learning (Egbert, 2006; McNeil, 2013).
- Bridge theory and practice towards professional identity development (Dooly and Sadler, 2013; Kitade, 2014).

Implications drawing on the benefits and challenges encapsulated above include: a lack of or incomplete institutional, peer and administrative support; time and financial constraints; confidence and access to e-learning resources; and belief in ICT benefits (Bustamante & Moeller, 2013; Lin et al., 2014). Summary guidelines have emerged from e-learning studies with respect to language teacher education and professional development, including the recommendations that teachers should:

- create CMC activities to bridge content and practical teaching experiences and observation (Kitade, 2014; Sardegna and Dugartsyrenova, 2014)

- design interaction carefully towards situated, purposeful language learning in context (Dooly and Sadler, 2013; Egbert, 2006; McNeil, 2013)
- foster trainees' active involvement in their learning process (Bustamante and Moeller, 2013)
- build a nonthreatening learning environment conducive to collaboration and participation in a community of practice (Kitade, 2014; Sardegna & Dugartsyrenova, 2014).

Additionally, acknowledging the potential role of the digital divide on equitably expanding the positive effect of learning (Clark and Gorski, 2001), it is incumbent on developers and practitioners of new tools for teaching and learning to be mindful of the educational cost, for example by adopting low-cost netbook computers and open-source software (Warschauer, 2010). In this regard, language teacher educators should pay more attention to the factors that impact technology integration so that practitioners may design and provide all learners, regardless of their sociocultural backgrounds, with equitable access to improved e-learning environments (Liu et al., 2014).

THE NEED FOR FURTHER RESEARCH

There is a need to continue developing an empirical research base on the effectiveness of e-learning in developing multilingual competences. Such an empirical basis will guide policy makers to effectively meet the demands of the language learners, teachers and knowledge economies. For language policy makers, we still observe the lack of methodological consistency in the studies and sufficient attention to young learners (cf. Johnson, 2013). The research on the use of technology in language learning employs an array of methodologies, including some that are entirely experimental and others that rely on qualitative or descriptive statistics (cf. Leloup and Ponterio, 2003; Johnson, 2013). Non-experimental research often results in the use of self-reported data, learner discourse and qualitative studies. The use of such varied methodologies causes problems in categorizing and generalizing across studies (cf. Leloup and Ponterio, 2003) or in carrying out meaningful meta-analysis. Knowledge gained and generalized from systematically designed studies that analyze and report outcome data will supplement a growing understanding of what the technologies *can* afford, and will further advance the knowledge as to how technological affordances *should* be integrated in order to make a measurable impact on learners (Golonka et al., 2014). A sizeable number of research studies in peer-refereed journals fail to use 'well-established measures with clear reliability and validity' (Liu et al., 2002). Also, many of the published studies present such limitations as short-term experiments, small sample sizes, rare random sampling and narrowly focused aspects of language competencies (Zhao, 2003). Low and Beverton (2004) point out that to make research on ICT useful for policy initiatives, it is necessary to examine a range of variables, including the impact of new technologies and the degree of bilingualism in the sample of

subjects studied, and to take into account the existing ICT skills of the learners. In some respects, it echoes Chapelle's observation that 'as possibilities for technology, theory, and pedagogy expand, the need for evaluation has become more urgent' (2001: 26). The assessment of the 'value added' of ICT environments is particularly important in light of the numerous national policy initiatives in many countries and universities that are designing their own e-strategy plans.

Second, the majority of studies on the use of technology in language learning have been carried out with adult populations (Zhao, 2003). At the same time, the growing number of language learners and bilingual students at the K-12 level necessitates a broadening of the subject's research pool. Andrews (2004) cogently argues that among the central tasks confronting researchers is the need to develop conceptual models for e-learning and literacy development. Along similar lines, Golonka et al. (2014) call for more collaboration across disciplines to develop a greater interdisciplinary understanding of learning principles and outcomes. Going forward, we are thus tasked to develop a robust interdisciplinary research base that continues integrating e-learning and multilingual development in service of a deeper understanding of the individual's learning that is informative for educators and policy makers.

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