Accommodating English for Specific Purposes to Computer Assisted Language Learning

Cristina DIMULESCU[1], Andreea NECHIFOR[2]

Based on a descriptive approach regarding the content of the LanGuide project, but in perfect accordance with the literature review on CALL, the present article researches into the technicalities of developing a mobile application for foreign language learning and assessing, in four different specialised fields (academic, mobility, administrative and IT) offered for six different languages (English, Romanian, Slovene, Italian, Croatian and Spanish) at 3 different levels of knowledge (beginner, intermediate and advanced) and for 3 different learning personae (student, teacher and administrative staff member). Placing the users in the appropriate contexts by the task environment created for each exercise and including cultural elements from each of the foreign languages targeted, LanGuide manages to distinguish itself among other language learning mobile applications, by not only harmonizing ESP to CALL, but also by combining the pedagogy of the communicative approach to teaching a foreign language to that of the digital era.

Keywords: *digital era, mobile applications, ESP, CALL, language learning, computer science*

1. Introduction

Computer-Assisted Language Learning (henceforth CALL) is a constantly evolving field, "an emerging field that studies how technology is used as one (of many) tool(s) for language learning" (Chun 2011, 663). Taking this into account, Beatty (2010, 7) states that "a definition of CALL that accommodates its changing nature is *any process in which a learner uses a computer and, as a result, improves his or her language*" (italics in the original).

Broadly interpreted, such a definition encompasses the use of any kind of software that includes linguistic features, e.g. word processing tools or emailing applications that correct spelling and may even make suggestions concerning word

---

[1] Transilvania University of Braşov, cristina.dimulescu@unitbv.ro
[2] Transilvania University of Braşov, andreeabratan@unitbv.ro

use (Beatty 2010, 9). Referred to as the "e-factor" of learning, in which "e" stands for electronic, the Moodle platform was perceived by Nechifor and Purcaru (2013) as the best facilitator of imparting educational content to distance learning students who were thus included, for this reason, on the list of beneficiaries of the digital era of teaching. Approached in the same terms of positives and negatives, both a MOOC approach to learning and a blended one were minutely analysed by the same authors (Nechifor and Purcaru 2014; Nechifor 2015) in order to bring together learning and computers. With big dropout rates due to, broadly, inappropriate individual micromanagement, but very successful in terms of opening the access to massive education, the MOOCs represent a great embodiment of self-paced learning and very structured teaching mediated by electronic platforms, such as: edX, Coursera, Udemy, Udacity, etc, while blended learning integrates two teaching styles, a traditional one and a modern one, based on technology which enabled, in the case described by Nechifor (2015) a very interesting intercultural exchange on writing skills between students from Romania and Japan. Thus, CALL can be approached from very diverse perspectives and is, according to the latest developments of technology, under continuous change, mobile applications being the latest interest of the combined teams of linguists and IT specialists.

However, Garrett (2009, 719) is cautions against applying the label "CALL" to the mere use of such software or to the online search for authentic learning materials and is of the opinion that CALL means to integrate technology completely into the language learning process. The main purpose of this integration is to "improve the learning capacity of those who are being taught a language through computerized means" (Cameron 1999, in Gruba 2004, 623). In other words, CALL aims at meeting the needs of people who learn or teach languages by creating computer-based educational environments (Kohn 1995, 5). In order to fulfil this purpose, CALL has become a multidisciplinary field which relies on several other disciplines (Beatty 2010, 11), e.g. linguistics, psychology, education sciences, and, of course, computer science (Chun 2011, 663).

For this reason, it can be said that CALL is a multifaceted construct. Its main components are pedagogy, theory, and technology. Ideally, these three components are balanced and none of them becomes dominant at the expense of the other two (Garrett 2009, 720). Within these broad components, CALL specialists need to address aspects like instruction modes and material design, as well as issues related to technology or pedagogical theories in general (Beatty 2010, 8). Additionally, infrastructural factors need to be taken into consideration, too (Garrett 2009, 720). This bundle of components is in constant evolution (Beatty 2010, 8), being influenced by the development of technology and the dominant theoretical trends. The following part of the paper offers a glimpse into this evolution.

2. Literature review

In the second half of the 20th century, researchers and language teachers began to develop tools that allowed language learners to learn on their own. Their endeavours became easier in the 1970s and 1980s, when computers started to become available to more and more people. In the 1990s, the growing popularity of the internet made it possible for learners not only to learn on their own, but to easily form communities and work together with other learners (Gruba 2004, 625-626).

This historical evolution is paralleled by the evolution of the theoretical perspectives on CALL. In the 1970s and 1980s, structural CALL was the dominant trend, being influenced by the behaviourist theory of learning. In behaviourist CALL, computers were used mainly for drills and the focus was on accuracy. In the 1980s and 1990s, CALL came under the influence of the communicative language teaching theory. Communicative CALL exercises were designed to help students learn how to communicate fluently. After the 1990s, the focus shifted to the study of authentic discourse. This approach is named integrative CALL. It emphasizes meaningful, authentic discourse in the context of collaborative learning, and it encourages learner agency. CALL tools enable interactions with other learners (Gruba 2004, 626-629).

Therefore, it can be said that CALL has progressed from simpler tools, which mainly facilitated the acquisition of vocabulary and grammar, or offered the possibility to manipulate texts and practice dialogues, to more sophisticated multimedia instruments that make it possible for learners to communicate in a realistic way with other learners (Kohn 1995, 5). However, this progress cannot be considered completely linear: even recently created CALL tools may be just a visually updated version of a material type that was already used decades ago (Beatty 2010, 12).

As the previous paragraphs have already suggested, the main stages in the development of CALL have been influenced to various degrees by different theories of L2 learning. Chun (2011, 666) highlights four of the most important: the psycholinguistic theory, the interactionist view, the sociocultural theory, and the ecological approach. Psycholinguistic approaches look at CALL from the perspective of the cognitive phenomena that are involved in such a learning process, e.g. the individual's memory or attention, or the influence of material presentation on the person's cognitive load (Chun 2011, 666).

Interactionist approaches, on the other hand, zoom out from the level of individual learners and examine interactions between several students, trying to figure out how they negotiate meaning, how they react to one another's utterances and how they benefit from the dynamics of their interactions. In a

similar way, the sociocultural theory focuses on how learners construct their identity in the framework of their interactions and how they improve their intercultural competence while learning a new language (Chun 2011, 669-674).

Finally, ecological approaches adopt an even broader perspective and look at "how learners interact with and influence their environment" (Chun 2011, 676), technology being considered an element of this environment that provides students with learning opportunities.

The role of such interpersonal relationships and learner-environment interactions seems to be so significant that some scholars even describe CALL as being a complex adaptive system, i.e. a set of interdependent variables like learners, educators, policy makers, learning materials or institutions, which interact and constantly change during their interactions (Schulze 2017, 302). It can be said therefore that "CALL is made possible through an interdependent relationship among computers, students, and instructors" (Gruba 2004, 630). Each of these participants plays its own part in the learning process.

Computers, for example, serve the purpose of creating learning opportunities both in classroom settings and beyond them (Chapelle 2008, 586). This, in turn, influences the role played by learners themselves: because the computer is there for them even outside the classroom, they are expected to learn in a more autonomous way than they would in a classical language learning setting. Learners have the power to configure their own learning, even if this kind of autonomy is often limited by the nature of certain CALL tools which only allow students to perform a series of pre-established, repetitive actions (Beatty 2010, 11-12).

In order to foster true learner autonomy, CALL materials need to be relevant and target the specific language difficulties that the learner is struggling with. Furthermore, they should improve the student's general learning style (Chapelle 2008, 588). Under these circumstances, the role of language teachers has transformed: their activity in the lesson has become less prominent and they have become only a kind of mediators between learners and technology. Furthermore, instructors need to become acquainted with new technologies in order to cope with the growing popularity of CALL (Gruba 2004, 636-637). This is a challenge for teacher education as well (Chapelle 2008, 586), which is expected to prepare future teachers for integrating technology into their lessons.

The aspects discussed above – theoretical approaches, participants' roles – go beyond mere theory and have a tangible impact on the type of CALL materials that learners actually engage with. Garrett (2009, 722-723) describes a few relevant examples and explains that behaviourist CALL, for instance, relied mostly on tutorials, i.e. grammar drills, dictation, pronunciation exercises, but more complex, skill-centred activities were also possible. Another type of CALL tool

requires learners to interact with authentic materials, that is, with discourse that was not created for learners but for native speakers, by native speakers. Apart from teaching linguistic items, these materials improve learners' metacognitive strategies as well.

A third type of CALL tool, which may be called communication-oriented CALL, also emphasizes authentic language, e.g. in the context of social networks (Garrett 2009, 723). As Schulze (2017, 303) states, this kind of computer-mediated communication, unlike tutorials, allows learners to "interact with other learners, instructors, and L1 speakers *via* digital artifacts" (italics in the original).

But even if such sophisticated tools are not available to a teacher, he or she can integrate CALL into the lessons by using the CDs, DVDs, digital textbooks and other kinds of software that most publishers add to their textbooks (Bush 2008, 447), as well as direct links to repositories hosted on the internet as databases for different textbooks, manuals, students' books, under the form of audio/video support. Apart from these resources, teachers and learners can avail of such simple but useful CALL tools as digital flashcards, which have "a vast potential to empower effective learning at all ages and levels" (Obermeier 2020, 26).

Nowadays, the rapid evolution of mobile phones and other devices such as televisions or gaming platforms creates new possibilities for CALL to reach its users even more easily (Beatty 2010, 39-40).

To sum up, CALL has many sides: one can look at it from several perspectives, ranging from scientific, theory-driven approaches to practical, hands-on views concerned with the specific CALL tools that learners can use. Given this fact, it comes as no surprise that CALL has ignited the interest of researchers from various fields. The following subsection briefly discusses this research activity.

2.1. CALL research

Specialists interested in language teaching and learning have employed various types of research designs in order to investigate CALL. Most research in this field is descriptive: studies adopt either quantitative or qualitative approaches to CALL, trying to understand its mechanisms and the way the participants involved in the language learning process work with it. These studies have provided researchers with valuable findings, e.g. the importance of developing not only specific language skills, but also learners' general learning strategies and motivation, or their ability to use discourse in order to communicate online (Chapelle 2008, 590). Moreover, this also offered a good basis for observation regarding the way in which different applications can be developed in order to ease the user's approach, from interface,

user friendliness to types of exercises, their dynamics within these applications, as well as the contribution they bring to the language improvement of a user.

Consequently, although such descriptive studies are of great value, some researchers want to go a step further: besides describing how CALL works, they aim at assessing how useful or effective this kind of language learning is. This can be achieved by means of evaluative research design. Many of these studies take an experimental or quasi-experimental approach in order to obtain data concerning the quality of CALL. Evaluative research usually compares learning outcomes in CALL settings with learning results in traditional settings. This means that it is the pedagogical component of CALL that is actually assessed, and not so much the technological one (Chapelle 2008, 590-591).

Apart from descriptive and evaluative research, there have been a few studies that approached CALL from a critical perspective: CALL is not only described or evaluated, but placed into a larger context and examined in relationship with the beliefs and views on technology that participants in the learning process hold. Some researchers who adopt this perspective say that technology does not always have a positive impact on the learning process, since it may make learners less curious and proactive (Chapelle 2008, 592).

Though CALL provides scholars with a wide range of possible research topics, studies in this field seem to be relatively difficult to design. As Schulze (2017, 302) underlines, studies focusing on CALL either have a rigorous research design but only look at isolated, decontextualized variables, or they try to take a more holistic, ethnographic approach but their design does not fully meet all the scientific requirements. Despite such shortcomings, research has managed to reveal several aspects that contribute to a better understanding of how CALL works, where and how it can be applied, and what its benefits are. In what follows, these aspects will be discussed alongside an example of an activity that is part of the development of a CALL tool within the framework of the LanGuide project.

2.2. Applicability and benefits

When it comes to applicability, it can be said that CALL is very versatile, as it can be used successfully in various sectors of language teaching, learning and assessing. For instance, CALL tools can prove to be a useful instrument for learners and teachers of language for special or specific purposes, languages that are less commonly taught or heritage languages. CALL can also improve learners' reading comprehension and even play a part in the training of translators and interpreters (Garrett 2009, 725-729).

And this happens to be the specific case of LanGuide, Language Guidance Tool for Improving Language Knowledge, an ongoing project that is aimed at creating an open access tool designed for university students, teachers and administrative staff and whose targeted fields belong to different areas of specialisations (administrative, mobility, academic and IT), addressing the area of applied linguistics researching into specific purposes, and whose other languages besides English involved in the application developed include: Romanian, Italian, Slovene, Croatian and Spanish in fine tuning with what Garrett refers to as less commonly taught or heritage languages (infra).

2.2.1. The LanGuide project – good practices of CALL

LanGuide's main objective is to facilitate "the acquisition of LSP for different fields, difficulty levels and languages" (Kompara Lukančič and Fabijanić 2020, 42). In addition to such academic benefits, LanGuide users can also develop their intercultural understanding, thanks to the multilingual nature of the app (Kompara Lukančič and Fabijanić 2020, 44).

The LanGuide project started from the very beginning as a mixed-type Eramus+ project, gathering together two teams from two different fields: linguistic and IT, each of them multinational. The linguists' team harmonized the opinions of teachers with experience in L2 teaching, teaching L1 as a foreign language and teaching L2 for specific purposes from Romania (Transilvania University of Brasov), Slovenia (University of Primorska), Spain (University of Castilla-La Mancha) and Croatia (University of Zadar), while the IT team brought together the visions of specialists in software development from Croatia (University of Rijeka) and Sweden (Mälardalen University).

The intellectual outputs were devised in a chronological manner and were based on good communication and collaboration between the two teams, as they were primarily envisioned as taking place in joint meetings. And even if, after such common workshops, each team was set on producing their specific outputs, the next meeting would bring them together again in order for the linguistic content-production to be harmonized with the computer science engineers' perspective.

Thus, first and foremost the linguists agreed upon a common framework of exercises production for the English language, for the aforementioned fields, which was submitted to peer-reviews upon completion. Further on, the linguists carried on the creation of exercises for their own languages, according to the same framework used for English, in order to cater for the needs of as many users as possible, and at the same time to meet the target set by the project, that of

offering other languages for learning via the mobile application, for the fields considered, other than English.

As a second step, the IT team created the Content Management Platform or the digital content for the future mobile application, i.e. the place where the collection of exercises created by the linguistic team could be uploaded, according to a set of processes and technologies, in order to be appropriately managed, sorted into categories commonly agreed upon beforehand by both teams and prepared for publishing in the form of a mobile android application.

Consequently, as a third step, the linguists introduced the exercises in the CM and its repository of images and video/audio input while adjusting and adapting some of the content to the categories/types of exercises offered by the CM and envisioned for the final mobile application: drag and drop, multiple choice, and fill-in, the first two under the form of drop-down menus.

In the final phase, the IT team developed the mobile application desired, based on the exercises created by the linguists, in the form offered by the CM, and as a result of another joint meeting where the experts from both fields negotiated and decided upon technical details regarding the application: interface, enrolment, user choices in terms of language targeted for practice, language level, field of interest and personae, exercise display, exercise traceability, as well as results and scores display and feedback. All this was put on the canvas offered by Miro, the skeleton for the mobile application being designed online with the participation of everyone involved in the project, thus benefitting from both perspectives over the final product: linguists' and software specialists'.

In its final phases before official release, the application was submitted to internal and external sessions of trials, exposed to testing and subjected to the stakeholders' opinions, their feedback being officially collected in the form of anonymous answers to an online Google form questionnaire which targeted to amass information regarding both the quality of the exercises created by the linguists and on the quality and user friendliness of the application designed by the IT team. In this way, Gruba's opinion that "CALL is made possible through an interdependent relationship among computers, students, and instructors" (Gruba 2004, 630), mentioned before, is successfully abided by as, indeed, each of these participants brings their own contribution to the success of the mobile application, according to the roles described in this section.

2.2.2. The case of LanGuide - CALL analysis

The LanGuide project productions observe, on the one hand, Chun's psycholinguistic theory, as the exercises created by the linguistic team are

approached from the perspective of the cognitive phenomena that are involved in the learning process: the learner's memory and attention, as well as the importance of the cognitive load (Chun 2011, 666), as mentioned above. But also, on the other hand, they meet the criteria of Chun's sociocultural theory (Chun 2011, 669-674), as a great deal of interest was dedicated to the aspect of placing the learners in the framework of their possible interactions in the real contexts of the fields whose specialised vocabulary they want to learn and of the cultural background of the languages they want to lean.

Subsequently, Schulze's (2017) observations regarding the interdependency of the actants involved in CALL, as well as the functions of the interpersonal relationships and learner-environment interactions are also fully considered by the LanGuide specialists. They are reflected not only in the way in which the teams worked together, as described above, adhering both to the principles of current education practices and to the policies of their institutions, but also and more prominently in the way in which the exercises were built by the linguists: carefully placing the users of the application, with each task environment, in the real-life context of the academic field, of a mobility exchange, of a secretarial or administrative situation which needs to be addressed or solved in the country where the mobility takes place or even when using the internet or any other aspect in the IT field. Thus, the cultural element was professionally integrated in the background of the exercises build by the linguists thus ensuring, in the long run, a certain degree of learner autonomy that Chapelle was talking about (2008) by exposure to authentic learning cotexts imbued in the discourse of the exercises as if they were created for native speakers, by native speakers.

Still on the same path with Chapelle (2008), the student's learning style is encouraged to develop by LanGuide's CALL approach, as the freedom of choice offered by the selection any user can make in terms of exercises, based on a self-evaluation of the relative language level which anyone is free to perform before starting to use the mobile application, facilitates the creation of a personal profile: too easy – go back one level, too difficult - dare to take up the next level, low scores in reading – keep practicing this skill, high scores in grammar – focus on something else, etc.

Considering all of the above, the aspect of isolated, decontextualized variables, mentioned above as one of the main concerns with CALL, is successfully discarded by the LanGuide approach to foreign language learning, while the ethnographic component is beautifully catered for at the same time with meeting the scientific requirements of drilling and practising for language progress and continuous improvement.

2.3. Challenges

As highlighted in subsection 2.1., CALL can be seen as a system consisting of several interdependent elements, which are in constant interaction and change. Consequently, it seems natural that all these elements generate various types of challenges that CALL is faced with.

On the one hand, there are political, technical, logistical, and financial factors that may hinder CALL projects (Bush 2008, 461). On the other hand, CALL has to deal with the same major problem as traditional pedagogy: what students learn does not always satisfy their real-life communicative needs. Even if it is generally accepted that the ability to communicate is the final aim of any language learning process, learning activities do not always seem to work towards this aim (Kohn 1995, 5). This problem makes it clear that every CALL tool needs to clearly delimit the specific language problem that is to be addressed (Bush 2008, 448).

For this reason, no CALL tool can be considered universally effective. A given material can be adequate for a certain category of learners, for the study of a certain linguistic issue (Chun 2011, 663). Or as Garrett (2009, 721) puts it, the efficacy of CALL "depends overwhelmingly on how it is used – that is, what language learning activities it supports – and how well its use is integrated into the syllabus".

At the same time, the majority of CALL tools have an important limitation: they are not able to deal with unpredictable answers that learners give, e.g. sentences or longer texts. In such cases, the teacher's feedback remains necessary (Beatty 2010, 12-13). In fact, the absence of feedback coming from a teacher may become especially problematic in the case of computer-mediated communication, i.e. when learners communicate more or less informally with other learners. This kind of setting may lead to the reinforcement of errors, since learners may not recognize one another's errors, or may leave them uncorrected even if they recognize them (Bush 2008, 452-453). In the case of such materials that are based on the integrative approach to CALL, assessment of learning outcomes may be difficult as well (Gruba 2004, 642).

Another possible pitfall that CALL specialists need to avoid is the inappropriate use of technology. When a new CALL tool is developed, its creators may run the risk of considering technology more important than the pedagogical component of the material. They may focus on technology for its own sake, trying to figure out the different ways it can be used, instead of concentrating primarily on the language learning problem that could be solved using that technology (Bush 2008, 465). That is why, LanGuide gathered the two teams of specialists in common

workshops and meetings, as described in the previous section, and even if certain compromises had to be reached on both sides, the common path was found to the benefit of the final users.

Technological aspects may sometimes make the creators of CALL materials to take the easy way out, i.e. to design tasks that are easy for computers to perform and evaluate, but are not very useful for learners, which was definitely not the case of the LanGuide project, long explanations being provided on the part of the linguists to the IT team when language aspects couldn't be dropped to the detriment of the final users and equally long technical meetings being held by the IT team to make the digital approach clear to the linguists in order for user friendliness to be attained. In this way, Beatty's words (2010, 41), "a lot of CALL software is stuck in a behaviourist rut partly because offering a behaviourist mode of instruction is an easy thing for computers to do" were effectively dismissed by the LanGuide project teams, who eventually understood the final mission of a fruitful CALL approach. Along the same lines, Bush (2008, 455) argues that technology evolves rapidly, creating a certain complexity that is not always dealt with in an appropriate way in the field of CALL.

There are, however, a number of guidelines that can help the creators of CALL tools in their efforts to keep technology and pedagogy in balance: identifying the specific purpose of using technology, finding the way to integrate the material into the lesson, defining what the teacher has to do while students are interacting with the material, and delineating the benefits that students will gain from using the material (Chapelle 2008, 589).

A different kind of challenge, which seems more difficult to address, is what Buendgens-Kosten (2020, 1) calls "the monolingual bias". This refers to the fact that some learners already speak several other languages apart from the language that they want to learn, but CALL materials are often unable to activate all the linguistic resources from all languages that learners bring with themselves into the learning process. As Buendgens-Kosten (2020, 1) says, there is "a lack of CALL products and projects that realize this potential, or that support specific plurilingual skill development".

The CALL materials that do aim at plurilingualism are usually non-commercial, being funded by organizations such as the European Union (Buendgens-Kosten 2020, 10). The LanGuide project is worth mentioning in this respect too: being the result of an international collaboration and incorporating several languages, it "aims to support the European objectives of promoting interculturality, multilingualism and digital learning" (Kompara Lukančič and Fabijanić 2020, 44).

To conclude, CALL specialists have to successfully tackle certain issues in order to make sure that the final product, which will be used by language learners and teachers, meets its users' requirements in the best possible way. This effort is characteristic of every stage of CALL material development, from the preparatory stages to the final touch added to the end product.

3. Conclusions

Irrespective of the teaching and learning environment in which it is applied, CALL displays a number of general advantages. One of its most significant benefits is the possibility to instantly adjust the learning input to the specific needs of the learner (Bush 2008, 465). Furthermore, CALL tools provide learners with instant feedback on their answers. In this way, every learner is aware all the time of his or her own performance (Chapelle 2008, 586). This can be useful in monitoring and correcting his or her learning process, leading to increased autonomy. All this was entirely understood and put into practice by the creators of the LanGuide mobile application, as all these aspects are efficaciously met by it, according to the minute description in the sections above.

Besides these benefits that every learner can enjoy, CALL tools can offer additional support to certain categories of learners: "computers have the potential to help students with special needs, for example, in their use of screen readers, Braille devices, or other assistive technologies" (Gruba 2004, 632).

Some other advantages of using CALL tools have been highlighted by neuroscience. For example, Hsu (2020, 1) examined the waves produced by language learners' brains in three second-language interaction scenarios: face-to-face interaction with a real human; virtual platform-mediated interaction with a real human; interaction with an artificial intelligence chatbot. Learners' levels of attention and meditation were also measured. His findings suggest that "learning effectiveness similar to human face-to-face interaction could possibly be achieved if learners interact with social robots" (Hsu 2020, 14).

Moreover, not only do learners acquire new language in an effective way, but they also seem to benefit from CALL from a psychological point of view: they seem to overcome their fear of making mistakes and tend to be more confident when they interact with a chatbot rather than a human being (Hsu 2020, 16).

All these aspects may make one think of CALL with unconditional enthusiasm. However, Hsu (2020, 15-16) cautiously mentions that while CALL may be a great instrument for learning vocabulary, it may not be that effective when it comes to learning more complex sentences. This reminds us of an important fact:

in order to yield the above-mentioned benefits, CALL has to overcome a number of limitations or challenges, which the LanGuide project has tried to master, as specifically referred to above, its language mobile application being under continuous improvement after the evaluation process in order to bring it to its best version possible.

Acknowledgement

References

Beatty, Ken. 2010. *Teaching and Researching Computer-Assisted Language Learning*. Second Edition. Harlow/London: Pearson Education Limited.

Buendgens-Kosten, Judith. 2020. "The Monolingual Problem of Computer-Assisted Language Learning." *ReCALL FirstView* 1-16. https://doi.org/10.1017/S095834402000004X.

Bush, Michael D. 2008. "Computer-Assisted Language Learning: From Vision to Reality?" *CALICO Journal* 25(3): 443-470.

Chapelle, Carol A. 2008. "Computer Assisted Language Learning." In *The Handbook of Educational Linguistics*, ed. by Bernard Spolsky and Francis M. Hult, 585-595. Malden/Oxford/Carlton: Blackwell Publishing Ltd.

Chun, Dorothy M. 2011. "Computer-Assisted Language Learning." In *Handbook of Research in Second Language Teaching and Learning.* Volume II, ed. by Eli Hinkel, 663-680. New York/Abingdon: Routledge.

Garrett, Nina. 2009. "Computer-Assisted Language Learning Trends and Issues Revisited: Integrating Innovation." *The Modern Language Journal* 93: 719-740.

Gruba, Paul. 2004. "Computer Assisted Language Learning (CALL)." In *The Handbook of Applied Linguistics*, ed. by Alan Davies and Catherine Elder, 623-648. Malden/Oxford/Carlton: Blackwell Publishing Ltd.

Hsu, Liwei. 2020. "To CALL or Not to CALL: Empirical Evidence from Neuroscience." *Computer Assisted Language Learning*. Online article, PDF: 1-24. https://doi.org/10.1080/09588221.2020.1750429.

Kohn, Kurt. 1995. "Perspectives on Computer Assisted Language Learning." *ReCALL* 7(2): 5-19.

Kompara Lukančič, Mojca and Ivo Fabijanić. 2020. "LanGuide – A Tool for Learning English." In *English and Italian in the Frame of Genre-based Research and Foreign Language Teaching*, ed. by Jasna Potočnik Topler, 33-74. Maribor: University of Maribor, University Press.

Nechifor, Andreea and Monica A.P. Purcaru. 2013. "The 'E'-Factor of the Educational System: The Electronic Platform." *Bulletin of the Transilvania University of Braşov,* No. 2, Series VII, 6 (55): 19-26.

Nechifor, Andreea and Monica A.P. Purcaru. 2014. "On MOOC." *Bulletin of the Transilvania University of Braşov,* No. 2, Series VII, 7 (56): 31-38.

Nechifor, Andreea. 2015. "On Blended Learning: Japanese and Romanian Telecollaboration – Positives and Negatives." *Bulletin of the Transilvania University of Braşov,* No. 2, Series VII, 8 (57): 43-50.

Obermeier, Andrew. 2020. "Exploring the Effectiveness of Deliberate Computer-Assisted Language Learning." *Vocabulary Learning and Instruction* 9(2): 24-38.

Schulze, Mathias. 2017. "Complexity Approaches to Computer-Assisted Language Learning." In *Encyclopedia of Language and Education. Language, Education and Technology. Third Edition*, ed. by Steven L. Thorne, and Stephen May, 301-312. New York: Springer.