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Where is e-learning headed?

Relating simulation and gamification to a possible shift in education

Abstract

E-learning is a rapidly developing field that affects not only teachers and students but also content developers and hardware manufacturers. As e-learning developed, a number of psychological and learning theories have been applied which also contrasted the current state of the available technology. Nowadays, constructivism is largely seen by the literature as a guiding frame. Technological developments are becoming rapid and are affecting a larger student population than before, who are already socialized in them to varying degrees. For this reason it is important to be aware of how the field is developing and what patterns could point toward a new e-learning frame. The present article establishes a frame for e-learning generations and aims to predict an upcoming state, and supports this position by analyzing the findings of research articles that illustrate this development.
Keywords: technological development, learning theories, ubiquitous learning, virtual realities, gamification, language education

1   Introduction

E-learning is a growingly interdisciplinary field. It is a framework that is increasingly applied to meet educational challenges and make use of the growing number of technological advancements to suit learner and teacher needs. To achieve this goal a number of approaches with varying use of gadgets, face-to-face and online instruction have been developed. These encompass fully online, blended, mobile and virtual environments.

E-learning is discussed as an evolving field, focusing on the pre-Internet and Web 2.0 eras to demonstrate how the application of learning and psychological theories corresponds to technological developments. These eras encompass a number of decades which have led to significant changes in the World Wide Web's access and role. This is followed by an analysis of three developing technologies: ubiquitous learning, virtual realities and gamification. Finally, these are related to the potential further development of e-learning as a field as well as what kind of effects it would have on language education as such.

2   E-learning as an evolving field

Looking at e-learning from a historical perspective, a number of patterns emerge. First, it can be divided into two major eras; e-learning prior to the Internet and e-learning after the emergence of the Internet. Although the borders of the two are not strictly clear cut and are more understandable as an evolution of what technologies are applicable to learning, there are

significant differences. These periods are characterized by highly different approaches to learning and showcase a development cycle through three different psychological theories. This is also reflected in the technological dimension as the second era underwent this development through a fraction of the time due to the advancements made in the field.

2.1 The pre-Internet era

The first period of e-learning was characterized by the dominance of computers. Beatty (2013: 18) makes the point that computer-assisted language learning (CALL) projects have been present since the 1950s. Dudeney and Hockly (2012: 533-4) discuss Warschauer (1996) and Bax's (2003) arguments relating to the time frame of 15 years prior to the emergence of the Internet which covers three distinct approaches leading up to the end of the 1990s. The importance of this classification is that it relates to a distinguishable era of CALL before Internet access became well-established (Dudeney & Hockly 2012: 536).

The psychological frames Warschauer (1996) and Bax (2006) mention correspond to Holmes and Gardner's (2006: 79) illustration of the theoretical foundations of e-learning including behaviorism, cognitivism and constructivism as well as how they argue user participation in e-learning changed which also centers around the behaviorist-cognitivist-constructivist developmental cycle (2006: 88) (Table 1). CALL's initial behaviorist focus is also touched upon in Jarvis and Achilleos (2013: 1). While Warschauer (1996) and Bax (2003) focus on CALL and Holmes and Gardner (2006) on e-learning in general, they showcase striking similarities that lead to a number of emerging trends.

The first trend concerns the connection between CALL and e-learning in general. Although this is a more obvious observation, it is worth noting that while CALL is only a subfield of e-learning, its development mirrors that of the general field itself. The second trend is related to the emergence of the World Wide Web and technological advancements in general. The reason behind this is that the behaviorism-cognitivism-constructivism cycle, that is at the center of the comparison in Table 1, points to a more open and integrative approach in the pre-Internet era in Warschauer (1996) and Bax's (2003) argument and a growingly community centered approach in Holmes and Gardner's (2006) figures. The conclusion that can be drawn from this comparison is that Internet access in itself was only half of the developmental process that eventually established the frame of today's e-learning. The second was Web 2.0 and its effects on the access to knowledge.

Periods	Descriptions of the pre-Internet CALL periods		Underlying psychological theory	Descriptions of e-learning periods in terms of users
	Warschauer (1996)	Bax (2003)		Holmes & Gardner (2006)
Period #1	behavioristic CALL	restricted	behaviorism	single user (behaviorism)
Period #2	communicative CALL	open	cognitivism	single user (cognitive constructivism)
Period #3	integrative	integrated	constructivism	multi user (socio-constructivism) community (communal-constructivism)

Table 1: A comparison of the CALL period descriptions of Warschauer (1996) and Bax (2003) in Dudeney & Hockly (2012: 534) and the e-learning periods in Holmes & Gardner (2006: 79, 88)

2.2 The Web 2.0 Internet era

Web 2.0 represents the foundation of the current online solutions. According to Dudeney and Hockly (2012: 538), this was a transition from a "static, expert-produced resource" to a "more creative, consumer-driven space". This development is in line with Holmes and Gardner's (2006: 88) description of e-learning taking on a more open, multi user approach. Based on this comparison, one could argue that Web 1.0 was hence an ineffective way of e-learning. However, this would be a more limited approach as there is evidence in the literature for Web 1.0 projects being successful in establishing connections between the in-class and outside would through providing authenticity to learning (see Ruthven, Hennessy & Deaney 2005: 29; Smeets 2005: 344) as well as stressing the beneficial effects of hypermedia (see Yeh & Lo 2005: 3).

While the above argument has focused on the fundamental technological difference between Web 1.0 and 2.0 and there exist in-depth analyses of the issue in the literature (see O'Reilly 2007: 18), a second important change is the expanding user base seen in Prensky's (2001: 1) digital native and immigrant distinction which is also marked by a shift in content development and access. These developments are at the center of the arguments about the Internet's role in the Web 2.0 age. Oral (2008: 438) sees the Internet's role in promoting and sustaining democracy while Weller (2007: 158) stresses that it was created for "robustness, decentralization and openness". However, it must be noted that Weller refers to an acquired role of the World Wide Web, as it was originally a military project. It can be argued that Oral and Weller's claims are in line with the constructivist approach to learning which have led to a number of projects which aim at the free dissemination of knowledge and learning materials. At the center of these are the massive open online courses (MOOC), open source solutions and the open educational resources. The latter is described by the OECD as "learning content, software tools to develop, use and distribute content, and implementation resources such as open licenses" (2007: 10).

Besides the technological and generational user differences, a third aspect of Web 2.0 that resonated within e-learning and CALL is the socializing aspect. Digital natives who engage in Web 2.0 environments whether actively as creators or passively as users will develop different skills than digital immigrants who were first exposed to Web 1.0 contexts. As Dowling (2011: 2) highlights the literature's finings, "learning using Web 2.0 tools encourages critical thinking and problem solving, collaboration and communication, global awareness and information literacy, the so-called "21-st century skills". This means the skills developed through Web 2.0 are not only specific set but are also connected to the information age.

There are projects which seek to develop tools to measure the level of digital nativeness of such students like Teo (2013). This is an important issue as there are contradicting approaches to what age group is actually covered by the term (Jones, Ramanau, Cross & Healing 2010: 763) and the level of digital divide between students and teachers (Waycott, Bennett, Kennedy, Dalgarnoc & Gray 2010: 1208-9). While Web 2.0 is becoming a lifestyle for digital natives (Ng 2012: 71), there is need for guidance for students to learn how to apply their Web 2.0 skills to other contexts as their free time. Thompson (2013: 23) argues that this scaffolding can result in "go[ing] beyond the rapid communication technology they are most comfortable with and learn[ing] the wide variety of technology tools that are important for productivity in school and the workplace". This scaffolding for e-learning can be found in the form of constructivism.

2.3 Constructivism as the theoretical frame of e-learning

Constructivism as a learning theory is well-suited to be the theoretical frame of e-learning in the Web 2.0 era as well. Two important features need to be mentioned as it changes both knowledge dissemination and application. Moving away from behaviorism, cognitivism already focused on "the open-ended problem solving types of cooperative learning" (Ferguson 1995: 59). This trend was built upon by constructivism where, as Keengwe and Onchwari (2008: 53) explain based on Brooks and Brooks (1999) "the traditional role of instructors as dispenses of information is challenged, and the new role instructors is that of a guide: to challenge students' thinking and encourage reflection in the learning process". This changed hierarchy allows students to be more involved in their own learning and makes it possible for them to develop their own understandings instead of accepting a pre-structured model.

As the focus of the present paper is to relate the developments of e-learning to language education, it is important to look at how this translates to that field. Constructivism allows for parallels to be drawn between subject areas that are opposites like science and language classes. Taber (2015: 128) argues that "[t]he key constructivist thinkers in science education were not arguing that students *should* construct their own knowledge […], but rather that it is the nature of human cognition that learners *will* need to construct their own knowledge [italics added by Taber]". This shows that at this level there is theoretically no difference between how languages and sciences are approached as the knowledge construction goal is the same. This similarity is evidenced by Ziglari and Parviz's (2012: 2131) point concerning constructivism in language learning by arguing that students "[l]earn the materials while they are collaboratively involved in the act of learning and the meaning is constructed through negotiation of meaning". Relating to the relationships in such settings he adds that the "pattern of teaching is not T-S, but T-S, S-T, and S-S" (2012: 2131). To achieve said goals, constructivism is applicable to a number of e-learning settings which are discussed in the following.

3 The current e-learning frame

Quite often studies addressing e-learning start with a clarification of how the authors define e-learning. This is due to the number of ways it is approached which resulted in the lack of a clear, universally accepted definition. These can be sorted into two groups where the first is focused on differentiating e-learning and traditional materials and the second on how e-learning is present through the intersection of a number of fields.

Papp's (2005: 53) definition is a representation of the first category which emphasizes delivery, as he focuses on how electronically presented materials qualify as e-learning, even with the absence of a network. The role of ICT technologies is similarly addressed in Komenczi's (2009: 114) as well as in Sun, Tsai, Finger, Chen & Yeh's (2008: 1183) discussion. However, Garrison (2011: 2) stresses the role of communication in how e-learning is defined and in Clark and Mayer's case (2011: 8) the emphasis is on content delivery from the device aspect. Focusing on the intersection of fields is what characterizes the other major area of e-learning definitions. Kőfalvi (2006: 33) makes the point that e-learning represents a paradigm shift through ICT that affects both methodology and content. Similarly, the importance of this paradigm shift is articulated by Becker, McCaleb and Baker (2015: 74). Conole and Oliver (2007: 4) include both the implementation and research aspects in their approach. This means that although there are aspects such as constructivism being the

theoretical frame for e-learning that are more accepted in the literature as others, this definition plurality is not an easy matter to solve. As the goal of this paper is to demonstrate the directions e-learning as a field is developing toward and how it works as an interdisciplinary framework, it is discussed as such in the following.

Figure 1 illustrates e-learning as a framework where the interconnected nature of the main areas are illustrated in the form of a Venn-diagram. The four fields include face-to-face, computer assisted, mobile and online environments. Face-to-face contexts make use of the learners and teachers being in the same environment to reach learning goals. This is the traditional mode of instruction that is still very dominant. Computer assisted language learning (CALL) refers to, according to Jackson (2011: 13) education enhanced by computers. As Hockly (2013: 80) explains, mobile learning is a construct that is defined by the mobility of both the learners and the gadgets. While CALL and mobile learning represent constructs that are a combination of learning approaches and preferred gadgets, online environments refer to the application of web sources and also increasing student autonomy.

E-learning occupies the central position as it is utilized in all of them, thus it provides the areas with a unifying framework. There are four further combinations of fields that need mentioning as they point to either established or developing areas. The established areas are blended learning and technology enhanced learning. The former is at the meeting point of face-to-face, online and mobile approaches and the latter is a combination of computer assisted, face-to-face and mobile solutions. The developing areas are virtual and ubiquitous learning. Virtual learning can be found in the intersection of computer assisted, face-to-face and online environments as it is a learning solution that is employed both in classrooms and field trips to simulate environments that would not be accessible otherwise. The final area is ubiquitous learning which is illustrated as a combination of online, mobile and computer assisted approaches at the same time as it currently defined by device plurality.

While this model aims to encompass a number of varieties, it is by no means final. The main goal of Figure 1 is to illustrate how e-learning is the central framework in various learning approaches that encompass face-to-face, computers assisted, online, mobile, technology enhanced, ubiquitous and blended learning. There are further combinations possible as this frame only discusses the intersections of three of more fields. However, other areas were not included as they only present marginal differences to the fields in e-learning framework (e.g telecollaboration as face-to-face and online learning would be part of the larger blended learning frame).
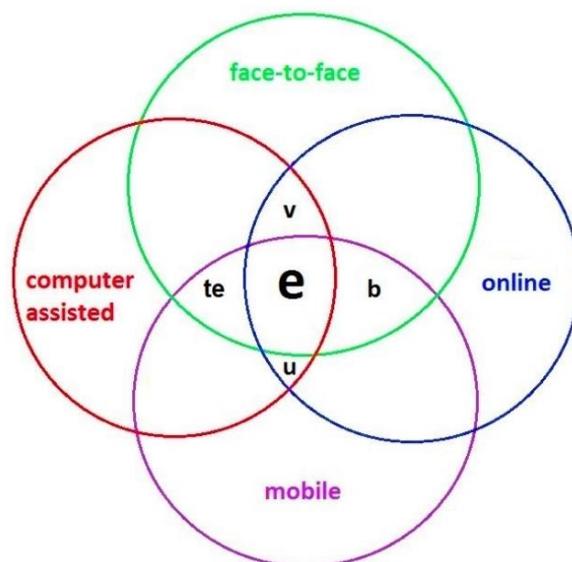
Figure 1: The interconnectedness of fields within the e-learning framework (e: e-learning, b: blended learning, te: technology enhanced learning, v: virtual learning, u: ubiquitous learning)

4   Developing technologies

A diachronic analysis of developing technologies is helpful to determine which approaches become established and which die out eventually. Martin, Diaz, Sancristobal, Gil, Castro and Peir (2011) analyzed *Horizon Reports* from 2004 to 2014 in terms of technological trends. Their findings were grouped into three categories: currently important, upcoming and promising areas. Martin et al. argue (2011: 1904) that "social web and mobile devices are currently the most important technologies for the near future in education". This relates to the Web 2.0 arguments about user communities and device plurality that was previously addressed.

Games occupy an interesting position in the upcoming technologies as Martin et al. (2011: 1904) point out that they "should also be considered as an important technology likely to have a deep impact on education, although it is not as extended as social web and mobile devices". Virtual realities are missing from their discussion but they address augmented ones as "promising technologies […] [that] do not have enough maturity in education" (2011:1904). For the present discussion, their conclusion is important, stating that "although these technologies are in their initial stages in education, they are becoming more important and will probably play an important role in the future" (2011: 1904). For this reason three areas are addressed: ubiquitous learning, virtual realities and gamification.

4.1   *Ubiquitous learning*

Ubiquitous learning marks a point in e-learning evolution where the concept of CALL needs to be revised. Adams, Montagne, Rodriguez and Stevens (2012: 1) claim that "[i]n an age where almost every modern communications device contains a computer, the idea of computer-assisted language learning becomes less and less meaningful". Ubiquitous learning

represents a field in e-learning where mobile and computer assisted approaches and devices can be exploited at the same time for learning purposes. This combination is noteworthy for a number of reasons.

At its core the application of multiple devices means new approaches to content delivery and development. Furthermore, learners can be engaged in new forms of interactions, thereby establishing a technological frame for virtual realities and gamification application as well. Moreover, the combination of wireless solutions makes it possible for learners to be engaged in their own learning both in- and out-of-class settings through the appropriate devices. History classes illustrate the multidevice perspective well as they can be used to set the learners in a simulated environment of the given epoch. Akkerman, Admiraal and Huizenga (2009: 450) discuss such a project where students were experiencing the mobile game 'Frequentie 1550' set in Amsterdam in groups and were engaged in exploration and various tasks within the virtual world.

4.2   Virtual realities

Currently in e-learning virtual realities and gamification are areas that are gaining more ground. With technological developments like the *Oculus Rift* and other virtual reality gadgets, the commercial market is opening up more towards audiences that would invest in such hardware that is not limited to the gaming community but people who see immersion as a future step in the development of the respective fields. In this understanding virtual realities represent a possibility to bring about a similar paradigm shift as Web 2.0 did.

The reason virtual realities possess such potential is that they can simulate environments that are not accessible due to financial, geographic and historical reasons but have inherent educational value. Furthermore, it would make the inclusion of students living with disabilities more accessible as they would be able to interact with their peers in real time but from areas of their choosing if it is necessary. Mikropoulos and Natsis (2011: 769) argue that virtual realities can be approached as "a mosaic of technologies that support the creation of synthetic, highly interactive three dimensional (3D) spatial environments that represent real or non-real situations".

Currently virtual realities can represent two forms of interaction in education. The first is through a virtual environment like *Second Life* where learners are interacting through avatars and need to adapt to the terrain. An example for this would be Petrakou's (2010: 1021) project where Swedish and American students were paired to perform a number of language tasks in a virtual space created in *Second Life*. This approach bears resemblance to the experience learners would have in video games as they need to follow the rules of the given world to accomplish their goals. The second approach is the opposite as there the learning environment adapts to the learners. This happens through the application of adaptive hypermedia systems which react to the user's needs and change their presentation accordingly (Reategua, Boff & Campbell, 2008: 530).

Both solutions can be put to use in educational settings, however, they serve different goals. Navigating environments through virtual avatars is a more complex setting that will arguably require learners to invest more in their progress as it mixes up not only the established status-quo of traditional classrooms but may also interaction in general. Communication in virtual spaces brings about the necessity of identity development for their avatars as Petrakou (2010: 1020) explains based on the literature that "social interaction is encouraged only if the online learning environment also allows for informal non-task specific

interaction, something that emerges naturally in traditional face-to-face campus education". Gamification is an approach that can make this immersion easier and by lessening the cognitive load of the students in virtual environments and aiming for an enjoyable experience.

4.3   Gamification

Gamification used to represent a somewhat stigmatized field within e-learning as the game element was understood more of a leisure than educational activity. However, in the last 5-10 years, coinciding with technological developments of the video game industry itself, this area has matured as well and gamification was researched in ways that went beyond the 'fun' aspect provided by the medium. The key aspects of gamification that are discussed in the following are the factors of socialization, simulation, identification and the community aspect.

Hayes (2010: 97) argues that "[c]omputer and video gaming are often considered to be potential routes to the development of aptitude and interest in using other forms of information technology (IT)". This links to the socialization factor that was stresses previously in the case of Web 2.0 and digital natives, however, it is also a transferable skill that can be initiated by enjoyment in gaming. Kuhn (2015: 1) addresses the issue as video games "becoming the preferred source of entertainment" for these generations which, as he argues paired with new literacy skills has a community creating effect. Concerning the interactivity of the medium Horowitz (2011: 8) writes that "[g]ames provide visual and audio simultaneously at a consistent rate, and they engage the player in real-time decision making". However, there are further aspects that make gamification a suitable educational method.

Kuhn (2015: 98) explains based on the literature that there are two types of games currently exploited at schools, namely educational and commercial games that are applied to reach certain learning goals. This is a noteworthy contrast as educational games, as the name implies, were developed primarily for the mastery or practice of a certain skill or content. However, they aim to capitalize on the less threatening and more enjoyable environments that are associated with commercial games as such. The reason why this type is also applied can be found in Sun, Ye and Wang's (2015: 170) argument based on Mohanty & Cantu (2011) about how commercial games have reached a stage when they can "precisely simulate complex real-world science principles, thereby giving learners opportunities for applying those principles to problem-solving". This makes immersion a more natural process for anyone engaged in the process as the world they are interacting in bears a much closer resemblance to the real world even if this is fantasy environment through more accurate application of physical simulation. Coupling the environment with "predefined character attributes that players (can) adopt for their self-perception with individual construction of character/self attributes in the moment of exposure" as Klimmt, Hefner and Vorderer (2009: 362) explain identification, is what truly makes immersion possible.

The final aspect that needs to be discussed in connection with gamification as a developing technology is the community building aspect that is a shared experience in case of video games in terms of enjoyment and that links to a similar digital native socialization. As Chik (2014: 88) explains based on the literature "digital gaming is not necessarily an individual activity: it is also a community- or team-based activity that involves gaming partners, either in physical proximity or in virtual game worlds". This is a major link that makes it applicable to language development and virtual reality projects like *Second Life*.

5   The next possible stage of e-learning

E-learning nowadays would be hardly imaginable without the Internet as the construct at its very core is device plus Internet. This pairing is not only a technological step in the field's evolution but brought about changes in the applicable learning theories as well. This is the reason why one is likely to come across categorizations like e-learning 2.0 in the literature. As e-learning is a field that mirrors technological developments, a fraction of the studies will be about experimenting with new technologies. These also show their age faster than works from other fields would as they often concern gadgets and solutions that are embedded in the everyday lives of the students and researchers. This rapid development and distinguishing modifiers like 2.0, 'new' or '21st century' point toward a need for classification of e-learning generations.

Karrer (2007: 3) differentiates three generations of e-learning, namely 1.0, 1.3 and 2.0 along the following criteria: main components, ownership, development time, content size, access time, virtual meetings, delivery, content access, driver and content creator. Concerning the first criterion, his differentiation between the 1.3 and 2.0 generations is in line with Cowie and Sakui's (2013: 460) point about Web 2.0 tools encompassing "blogs, wikis, podcasts, and social media". Though Karrer's (2007: 3) distinctions and arguments are informative, they lack certain areas which would make it valid for the present discussion. For this reason, I prepared a generational comparison of the e-learning paradigm a different set of criteria that include the defining theoretical frame, the role of the Internet, users, devices, environment, teacher-student roles, delivery, MOOCs, defining development, goal and an estimated time frame for each generation (see Table 2).

The three distinct phases of e-learning development currently present have been labelled as follows: e-learning 0.5, 1.0 and 2.0. These are in connection with the defining technological developments in the time period covered in the given generation. As e-learning was present before the Internet through the application of computers, this generation is presented as 0.5. The next is defined by the emergence of the Internet and is labelled 1.0. The domination of CALL can be attributed to the stages preceding mass access to the Internet and the early developments of mobile devices. The current 2.0 stage is connected to the effects Web 2.0 had on e-learning through content creation, openness and networking. This era is characterized by the mass access to smartphones, tablets and e-book readers and growing digital literacy. A fourth generation labelled e-learning 3.0 has also been added that takes into account the possible outcomes of current technological developments. The defining shift in the 3.0 frame would be mass access to simulations and AI assistants like *Apple*'s Siri or *Microsoft*'s Cortana. Working with such companions would provide a bridge between the smart devices of the users and their learning experiences thus applying the adaptive system approach to multiple devices in the form of ubiquitous learning and immersing the learners more in their experiences through virtual environments where they interact with each other to achieve real life objectives and develop their language skills accordingly.

Comparison	e-learning 0.5	e-learning 1.0	e-learning 2.0	e-learning 3.0
Defining theoretical frame	behaviorism	cognitivism	social constructivism (Sturm et al.: 2009)	social constructivism (Sturm et al.: 2009)
The role of the Internet	--	centralized (if present)	democratic (Oral: 2008) decentralized (Weller: 2007)	democratic (Oral: 2008) decentralized (Weller: 2007)
Users' skills	need to acquire computer skills	have to learn skills: digital immigrants (Prensky: 2001)	socialized in technology: digital natives (Prensky: 2001)	socialized in technology: digital natives (Prensky: 2001)
Devices	computer oriented	single device oriented	multi device and BYOD oriented	multi device and BYOD oriented
Environment	computer labs and home computers	hypermedia-based (Yeh & Lo: 2005)	adaptive hypermedia systems (Reategua et al.: 2008) multimedia-based	simulated and adaptive
Teacher-student roles	hierarchical	somewhat hierarchical	more equal	more equal and possibly includes AI assistants
Delivery	face-to-face	online and blended	online, blended, mobile, virtual and ubiquitous	online, blended, mobile, virtual and ubiquitous
MOOCs	--	xMOOCs (Alraimi et al.: 2015)	cMOOCs (Alraimi et al.: 2015) iMOOCs (Teixeire & Mota: 2014) MOOC 2.0 (Sharma: 2014)	cMOOCs (Alraimi et al.: 2015) iMOOCs (Teixeire & Mota: 2014) MOOC 2.0 (Sharma: 2014)
Defining development	the spread of computers	the emergence of the Internet	Web 2.0	the spread of virtual and augmented realities gamification and application of games for education
Goal	finding the role of computers in education	finding the role of the Internet in education	immersion and networking	immersion through simulation
Estimated time frame	~ from the 1950s to the late 1980s	~ from the mid-1990s to the early-to-mid-2000s	~ from the mid-to-late-2000s onward	~ from the mid-to-late-2010s onward

Table 2: A comparative presentation of e-learning generations

6   How e-learning 3.0 could relate to language teaching

While e-learning 3.0 is discussed as a future stage, there are a number of studies where the findings point toward the growing role of simulations and virtual realities in language education. Although this 3.0 stage is a prediction based on the technological developments and trends in the literature, and as such may or may not continue to expand in this direction, its potential impact on language teaching is worth discussing.

Currently as Hockly (2015: 310-1) addresses, the following forms of online learning are present: formal online courses, virtual worlds, MOOCs, open language learning communities and mobile apps for language learning. From this list MOOCs occupy a category that is still largely focused on behavioristic ways to feedback, however, a notable development in terms of MOOCs is the shift toward a more interactive approach (Teixeira & Mota 2014: 43). MOOCs are important from this perspective since they have been present for less than a decade, starting from 2008 (Teixeira & Mota 2014: 34) and started to showcase an evolution that favors cognitivist and constructivist approaches as opposed to a previous behaviorist one. The growing role of interaction is the key aspect of e-learning 3.0.

Striving for authenticity is a central issue currently in language education. The reason for this can be found in Luzón and Ruiz-Madrid's (2010: 162) explanation that "[a]uthentic tasks have the potential to foster meaning learning because they allow students to apply knowledge and skills that they will need in real life". Virtual realities and gamification can further this development by providing simulations where authenticity is still a key factor. Stanley and Mawer (2007: 7) argue that virtual worlds which provide the environment but no plot can be used "as a platform to build an engaging learning experience". This simulated and game based approach has a number of beneficial effects on language learning.

Allen, Crossley, Snow and McNamara (2014: 16) fond that it is beneficial for students to receive "writing strategy instruction within a game-based learning environment". Similarly promising arguments were presented by Horowitz (2014: 10) who highlights that "[g]aming […] can provide an excellent means for […] acquir[ing] vocabulary and sentence structure from real time interactions, either in a single-player environment or through online play with other learners". This means that a number of the students are already engaged in such environments and would be able to easily adapt and in a cooperative learning setting even provide guidance to their classmates. This has other promising merits as well as Reinders and Wattana (2015: 115) found in their study that their participants were "more willing to interact in English, were less anxious and felt better about (their ability to use) English in a game environment than in class". This points to a favorable position for virtual environments in the application of not only distance learning but the inclusion of learners with disabilities as well.

Overall, if the e-learning paradigm develops in a way as to include more simulations and gamified approaches, a shift in favor of computers as opposed to mobile devices is imaginable. Butler, Someya and Fukuhara (2014: 265) argue based on Garrett (2009) that "CALL continues to gain attention as a learning tool, and so have instructional computer games as part of CALL". While this argument about CALL regaining some of its former central importance through games is a valid point to consider, the sheer speed of technological development in other sections including mobile devices and new gadgets like the *Oculus Rift* virtual reality goggles only partially support it and point more toward a ubiquitous approach in the future.

7   Conclusion

The present paper looked at e-learning through a historical lens to determine which direction the field is developing toward. It was analyzed in a contrastive manner where four generations of e-learning were presented along a set of criteria. Each was argued to have a defining development that differentiates it from the previous generations. In the case of 0.5 and 1.0 this was the emergence of and mass access to computers and the Internet respectively. The current, 2.0 generation is described by a networked approach. It was theorized that based on the current technological developments and growing interest in the literature for virtual realities and gamification, a 3.0 stage would be characterized by increased immersion through these media. Concerning language education this would mean an extension of the authenticity approach. This means that not only real life environments could be exploited for this educational purpose but a number of virtual worlds could be constructed or applied to create a simulated space where authenticity would be achieved through learner immersion. Technological developments and a growing number of studies suggest that the field of virtual realities and gamification is maturing and moving towards this direction.

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