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METHODOLOGY

Efficacy of using mobile devices in education process

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Abstract. This paper presents different approaches of using mobile devices in education, the general perception of continuity between the use of fixed and mobile tools. A key theme of m-learning that mobility does not refer only, or even primarily, to devices, but to learners is outlined in the article. The findings are organized around research questions and there appeared five main themes: 1) different approaches in education; 2) when the devices are mobile; 3) when the learners are mobile; 4) when the learning experience is mobile; and 5) how to teach language with mobile devices. So considering sufficient teachers' preparation and students-oriented pedagogical formation processes, an efficacy of using mobile devices in education is claimed to be adopted in all higher educational institutions.

Keywords: *efficacy, mobile devices, learners, learning experience, approach, digital tools.*

Introduction. In the developing world, where mobile penetration is estimated to have already reached 89% (International Telecommunication Union, 2013) the proliferation of mobile devices may permit a leapfrogging of the desktop and laptop stages typical of developed countries. Mobile devices may be drafted into the service of a variety of language learning approaches from behaviorist through communicative to sociocultural approaches. An older *behaviorist approach* can still be found in some parts of language learning generally, as well as in so called 'tutorial CALL (Computer-Assisted Language Learning)' and 'tutorial MALL (Mobile-Assisted Language Learning)'. This gives rise to repetitive drilling of vocabulary, spelling, grammar and pronunciation, aiming at consolidation of foundational knowledge through flashcard exercises, quizzes or simple games. Many teachers agree that such activities have a place in the classroom, especially if they include a focus on meaning [5].

The communicative approach arose as the result of a shift towards a cognitive perspective, as Noam Chomsky's work on language performance and language competence, and Dell Hymes' subsequent work on communicative competence, led to a much greater emphasis on communicative proficiency [10]. Several interrelated points of emphasis emerging from cognitive and psycholinguistic research have proven to be of considerable significance.

Going beyond both behaviorist and communicative approaches, a newer *sociocultural approach* – or, more accurately perhaps, a sociocultural perspective – has recently come to the fore. Consequently, the focus of language teaching is 'increasingly moving away from linguistic inputs and products' towards a greater emphasis on meaningful, contextualized activity [3, p. 59]. The sociocultural perspective encompasses a number of approaches, many of which are more or less loosely related to the first approach in the list below. They include: *a sociocultural constructivist approach* (Vygotsky, 1978), which focuses on learners actively constructing knowledge in interaction with other learners: *a situated approach* (Lave & Wenger, 1991), which focuses on learners co-constructing knowledge within a particular social context; *an embodied approach*, which takes into account the relationship between the mind, the body and the environment; *an informal learning approach*, which focuses on the kinds of incidental, tacit and situated learning that takes place in everyday life; *a learner-centered approach*, which focuses on students' autonomy, agency and potentially their identity development, at which point this may blend into identity approach; *an identity approach* (Norton, 2000), potentially a more politicized version of a learner-centred approach that views language learning through the lenses of poststructuralism, critical analysis and critical pedagogy, as it focuses on students' development of agency and identity; *an intercultural (communicative) competence approach* (Byram, 1997) or *intercultural literacy approach* (Dudeney et al., 2013), which focuses on students' interactions and negotiations with others from different linguistic and cultural backgrounds, potentially including the development of agency and identity in intercultural contexts; *an ecological approach* (Lam & Kramsch, 2003; van Lier, 2004) or a complexity approach (Larsen-Freeman & Cameron, 2008), which takes a holistic view of the complex, interconnected processes involved in language learning, and again includes a focus on learners' agency and identity.

Literature review. The profound analysis of pedagogical and psychological literature testifies to the continuous scientific search for the solutions to this problem, and clearly highlighted in the works of Ukrainian and Foreign scholars as T. Kolodko, L. Vygotsky, M. Castells, S. Dikkers, G. Dudeney, C. Leadbeater, M. Milrad et al, N. Pachler, J. Stodd, and many others. Today, there is no doubt that the prospects of mobile devices are the pacemakers in education.

The objective of this work is to highlight the effectiveness of using the contemporary mobile devices in learning a foreign language and creates a rich learning experience for both, students and teachers. Thus, we suppose the tasks implemented in the article to be innovative, creative and suggest examining one of its options.

Research Methodology. The investigation used the following methods: general scientific analysis, synthesis;

theoretical – the analysis of scientific, educational and methodical literature on pedagogy concerning mobile learning as well as the references, theoretical generalization, systematization, collaboration and argumentation.

Results and discussion. As mobile technologies flourish around us, it's important to pause and ask ourselves: why should (or shouldn't) we be using these tools in education? What do they achieve? Whose interests do they serve? These questions go to the heart of what we think education is, or could be.

Is this picture familiar? Uninformed students sit silently in fixed rows, hands raised, waiting to be chosen to respond to a question from the teacher. Or they sit with their heads down, reading set texts and penning their answers, as they memorize facts for regurgitation in high-stakes tests. Most of us know this stereotype. Most of us have experienced some versions of it at some time. But this 20th century model the education, with its genesis in the late 19th century, is outdated, say critics [4; 7; 6].

In the desktop era, the Internet seemed like a separate place partitioned off from everyday life by monitor screens. Mobile devices, especially our multiplying smart devices, integrate the virtual and the real and the real as we carry the net with us, entertaining and informing ourselves and sharing our thoughts and experiences while we navigate our daily lives. Mobile devices also represent a return to embodiment, augmenting our brains and our senses as we interact with the world around us. As Manuel Castells writes of our era of mobile communication: 'We never quit the networks, and the networks never quit us; this is the real coming of age of the network society' [1, p. 448].

In discussions of digital technologies, we often hear about an increased emphasis on the *global* but especially since the advent of mobile phones, we've also heard about the increased salience of the *local*. While these points might at first seem contradictory, they're tightly intertwined with each other and with the ongoing transformation of our sense of space and place. Interestingly, the term 'm-learning' (mobile-learning) is sometimes seen as placing emphasis on mobility, seamlessness and the 'global', while the term 'u-learning' (ubiquitous-learning) or widespread learning, with which it's occasionally interchanged may be seen as placing emphasis on contextualization and embeddedness and thus the 'local' [8; 11]. But ultimately these are two sides of the same coin.

For many educators, digital technologies open up space for introducing new pedagogies and reworking old ones, with educational approaches, methods, curricula, syllabi and lesson plans being reimagined in light of the affordances of new tools. Like new technologies in general, mobile devices can support a whole spectrum of pedagogical approaches, starting with traditional transmission and behaviorist approaches. However, as in the broader e-learning research, there is an emerging consensus in the m-learning research that the affordances of mobile technologies are especially suited to promoting approaches like social constructivism.

Social constructivism, whose origins lie in the work of the Russian psychologist Lev Vygotsky (1978), is based on the idea that individual learners actively construct their understanding through their experiences and their interactions with others, as they integrate new knowledge with their existing knowledge base. Nowadays there are many versions and interpretations of constructivism [9], but there is a broad agreement that learning should be active and explanatory; social and collaborative; discussion-oriented and reflective; authentic and contextualized; and above all, student-centered.

We've become used to accessing digital materials in teaching, digital communications and digital networks from whatever real-world locations we find ourselves in. As the developed world in particular shifts increasingly towards a digitally mediated network society structure – our online and offline education overlap more and more. Our mobile devices contribute considerably to the fact that we find ourselves living simultaneously in a local space of places and a global space of flows [2]. In other words, we live in local real-world contexts and at the same time in online networks, which provide a permanent, pervasive, global context for our thoughts and actions.

The Internet can be useful with any skill area in learning a foreign language, being a great resource in practicing language skills. Having strong oral and written professional communication skills will make learners more competitive and more productive on their future jobs. As multimedia technology becomes more accessible to teachers and learners of foreign languages, it has become a practical tool to improve communication skills such as listening and speaking. Thus, students can interact with textual, audio, and visual media in a wide range of formats. This paper presents different multimedia means used in foreign English language classes with future foreign language students meant to improve their communication skills, speaking and listening in particular.

Now education can emerge much more fully from the classroom as we begin 'to utilize our everyday life-worlds as learning spaces' [13, p. 6]. The world has become the curriculum populated by mobile device users in a constant of expectancy and contingency [p. 25]. As we become more mobile and travel more, opportunities arise for learning, including language learning, across contents. But contents aren't just simple shells made up of the locations or times in which we occur. They're dynamic configurations of *where*, *when* and *who*, combined with numerous other elements such as *what* (activity) and *why* (purpose), and they even incorporate the technologies we use. Context-aware users, especially those with mobile context-sensitive devices, can engage in in contextualized learning, in other words, it's a process greatly aided by mobile devices which can highlight, capture and share the interconnected elements of a context that are most relevant to a given learning experience. Outside of formal classrooms, learning contexts don't exist a priori; they're created in the moment of learning.

It's become clear that m-learning (mobile learning) differs from e-learning (electronic learning), because of the affordances of the devices involved. In an early definition in 2000, Clark Quinn described m-learning as: 'e-learning independent of location in time or space'. By the time of the EU MOBI learn project project (2002-2005), the concept had been unshackled from e-learning and broadened to cover: 'any sort of learning that happens when the learner is not at a fixed, predetermined location, or learn-

ing that happens when the learner takes advantage of the learning opportunities offered by mobile technologies' [12]. In a widely cited definition, interaction and context were foregrounded in a description of m-learning as: 'the processes of coming to know through conversations across contexts among people and personal interactive technologies' [14, p.225].

In some scenarios, although, the *devices* are mobile in principle the learners typically move little if at all during the learning experience, which takes place in an unchanging location. Thus, the principle of mobility applies to the devices but not to the learners or the learning experience:

☑ devices ☒ learners ☒ learning experience

For example, mobile devices are an affordable way to set up connected classrooms where students can access the Internet, download apps, create content and communicate with each other and the world; sets of devices may be moved between classes and classrooms as desired. Or, in increasingly popular *flipped classroom models*, where more pedagogically tradition content transmission or behaviorist activities are completed outside class to free up in-class time for active learning, students may be expected to use their mobile devices not only in the classroom but at home as well. Mobile devices can also become the classroom in various kinds of distance learning, where they serve as an affordable supplement to, or substitute for, desktop and laptop devices. We see this in the arrival of mobile options for accessing global WWW (World Wide Web). We see it, too, in local services for potential students who don't have easy access either to PCs or to teachers, but who do have phones, which can be turned into classrooms in certain places and to the times.

In the above cases, the mobility of the devices may be little exploited. Actually, m-learning at this level might be seen as a kind of portable e-learning. In a connected classroom, students may retain at their desks in one fixed location, although the devices are rotated between classes from time to time. In a flipped classroom model, students may use their devices across two fixed locations, namely the classroom and home, but not while actually moving. In distance learning, too, students often use their devices in just one or two fixed locations where they can focus without distractions, whether that's in an air-conditioned office or under a tree in a field. In all of the settings, the mobility/portability of the devices is crucial since they must be transported between the locations, but students are not mobile while learning, and the learning experience itself is unaffected.

In some scenarios, the *learners* are mobile, even if the learning experience itself isn't affected by changing locations. Here are the principle of mobility applies to the devices and the learners, but not to the learning experience:

☑ devices ☑ learners ☒ learning experience

A certain amount of movement can be explicitly introduced into connected classrooms with pair work or group activities centered on collaborative, creative software and apps. Moreover, collective learning often emerges spontaneously, with students migrating around the room with their devices, forming groups around users who have discovered something new, sharing insights, and offering each other peer support.

Naturally, mobile devices can also be used on the move outside the classroom. There are regular of downtime in everyday settings, whether you're going for a walk, waiting for a bus, commuting on the underground, or taking time out in a café – or some similar combination or sequence of activity. Given the distractions of real-world contexts, says Julian Stodd, 'the environment conspires against complexity, at least for learning' [15]. That's why content consumed in everyday settings, and especially on the move, should ideally be granular, notwithstanding the risk of fragmented understanding. Both push and pull vocabulary – work on this principle of granularity.

The above cases are examples of *independent learning*, which is self-determined and, in pull services, self-paced. But it's possible to take independent learning a step further and free it completely from the oversight of teachers or strictures of courses, thanks to the growing digital knowledge commons and the rise of the freely available Open Educational Recourses (OER). While collaborative construction of knowledge, discussion of learning and community mentoring are quite possible online (think: contributing to Wikipedia), the reality more often involves simple transmission of bite-sized content (think: looking up a fact in Wikipedia). This may be a very kind of learning, but without structure or guidance it may amount to a very limited kind of education. Still, with these caveats, independent learning is a democratizing supplement to institutional learning; and in contexts where there are few institutions, teachers or even information sources, it may be radically empowering. In either case, it dramatically enhances students' autonomy and opens up lifelong learning possibilities.

In the above scenarios, the learners are mobile to varying extents during the process of learning, yet the learning experience remains largely the same, wherever it's accessed. These users are not making much of their settings to generate their own learning contexts or content. But when moving around the classroom, there are possibilities for drawing the context itself into the learning. And independent learning is very often inspired by contextual factors – as we use our phones to check details of places we're visiting or confirm facts we're discussing – and thus begins to shade into just-in-time learning, where the learning experience itself takes on a degree of mobility. M-learning at the next level can be a markedly different phenomenon from m-learning at other levels and, because it more fully exploits the affordances of mobile devices, can also be markedly different from e-learning.

In some scenarios, not only are the devices and the learners mobile, but so too is the *learning experience*, as learners shift between contexts that feed directly into their unfolding learning. Here, the principle of mobility applies to the devices, the learners and the learning experience:

☑ devices ☑ learners ☑ learning experience

In the classroom, as well as on excursions and outings, mobile devices support situated learning, as students receive or seek information from online sources, peers and mentors to inform their interactions with their contexts, and as they use their devices to make and share multimedia records of their contextualized learning experiences. In other words, they're turning real-world contexts into learning contexts at the point where their local experiences intersect with their global communications

channels, and where their personal experiences intersect with their social networks. Students' situated learning – captured, recognized, and represented as user-generated content – can be shared across digital networks, where it may be reused as learning material by other students [3]. We can see that the teachers are now considering how best to recycle and build on the user-generated multimedia content created by students around the school. It also demonstrates how a single mobile tool, in this case the iPad, can sometimes be used by largely immobile learners; sometimes by partially mobile learners; and sometimes as part of a mobile learning experience where students generate their own learning content.

It's been suggested that mobile devices promote a shift from traditional *just-in-case* to newer *just-in-time* learning [16]. The essence of this kind of learning is its relevance in terms of *when* (right now!), but also *where, who, what* and *why*, combined with brevity: not too little information, but certainly not too much. It's closely related to the idea of performance support, notably in a workplace-learning situation, but its applications go beyond this. Technologically, it's simpler to deliver just-in-time learning in pull mode, for example, might activate the text lens software on the smartphone and scan it to obtain an instantaneous translation. It's more complex, but increasingly possible, to deliver this kind of learning in push mode (*e.g. when the Ukrainian immigrant visits an Austrian doctor, a recommender system can automatically send the immigrant a set of relevant German language expressions through his location-aware smartphone).*

Just-in-time learning raises its own questions. Is systematic just-in-case learning a necessary complement to – or precursor of – personalized just-in-time learning? Do we need an overarching just-in-case structure to ensure episodic just-in-time learning doesn't become superficial or fragmented? Do we need to differentiate performance support from learning, with each individual applying filters, which facilitate performance (just-in-time), learning (just-in-case), or both together?

Crucially, not only are the devices and the learners mobile in all these scenarios, but so too are the learning experiences. The affordances of mobile technologies for linking the local and the global are present to some extent at all levels of m-learning.

Conclusion. The role of teachers is not to command and lecture but to orchestrate and guide. The affordances of mobile devices – their ability to promote learning, which is locally situated but globally, linked, initially episodic but ultimately extended, and highly personalized but socially embedded – mean that m-learning fits neatly with this kind of approach, especially, though not only, when the learning experiences themselves are mobile. Indeed, their affordances are powerful enough that mobile technologies may even function as something of a Trojan horse for introducing new pedagogical possibilities into resistant teaching and learning environments.

The study conducted does not solve all the above-mentioned problems. The perspective of the future research is to outline smart learning environment and methods based on information and communication technology (ICT).

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