From CALL to MALL in the Context of the Internet of Things

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Abstract

Over the years, Information and Communications Technology (ICT) has provided teachers with various tools to be used in the educational process, thus leading to major changes in the learning and teaching methods. Lately, the emergence of the Internet of Things (IoT) technologies has brought new insights into the use of various devices, such as computers, mobile devices, wearable sensors, etc. in educational settings. Taking into account that mobile devices (i.e. smartphones, tablets, laptops) have become near-ubiquitous, the education stakeholders have noticed the potential of these mobile devices for improving teaching and learning. Nowadays, there are various free, readily available tools for using mobile devices in the education field, some of them being geared towards language learning. In order to better understand the way language learning classes could benefit from the use of mobile technology, we focus on providing an overview of the mobile technology, its use and advantages for the language learning environments. However, at the same time, the continuous development of technology poses complex challenges for teachers, some of them being revealed in this presentation. We believe that the findings highlighted in this presentation can have important implications both for foreign language teachers as well as for teacher trainers, for the improvement of the teaching process.

Keywords: *Information and Communications Technology (ICT), Internet of Things (IoT), mobile technology/applications.*

1. Introduction

Although in time, Information and Communications Technology (ICT) has provided teachers with various tools to be applied in the educational process, at present, the education activities do not fully benefit from new innovative technologies. For example, in [1] authors argue that "there is a need to re-conceptualize learning for the mobile age, to recognize the essential role of mobility and communication in the process of learning". Mobile devices, usual possessions of almost every student nowadays, can have a positive impact on the efficiency of education methods. However, the use of mobile devices has both pros and cons. Due to the fact that today's university students use mobile devices anywhere, even in the classroom, despite the rules, they must learn to use them responsibly in the educational process. Lately, the emergence of Internet of Things (IoT) technologies has brought new insights into the use of various devices, such as mobile devices, wearable sensors, etc. in educational settings, with high potential for improving teaching and learning.

According to various researchers, advances in emerging technology could reshape education in unprecedented ways and teachers need to be prepared to face new challenges.

1.2 Paper Contributions

This paper aims to answer the following research questions:

- What is MALL concept?
- How can mobile technology help language learning?
- What is the Internet of Things (IoT)?
- How could we adopt IoT in the process of language learning and teaching?
- What impact will all this have on the foreign language class?
- To adopt mobile technology in teaching and learning activities, do teachers and students need additional knowledge and skills other than the ones they use in everyday life?

In order to answer the above questions, the paper continues with presenting some definitions of CALL, MALL, and Internet of Things concepts. Next, examples of mobile technology application in the teaching and learning of foreign languages, in the context of Internet of Things, are highlighted. Also, we consider some of the benefits and challenges that come with the adopting of new technologies in the educational process. Finally, we draw future work and conclusions.

2. Application of mobile technology in foreign language learning in the context of Internet of Things

2.1 Definitions

In order to discuss impact of MALL and IoT on language learning activities, we need to understand what these concepts mean. Concepts such as Internet of Things, CALL and MALL have no precise and widely accepted definitions. The literature in the field proposed some, but we have selected those presented in the following paragraphs, that allow the reader to get an overall view of these concepts.

CALL, the acronym for Computer-Assisted Language Learning is "any process in which a learner uses a computer and, as a result, improves his or her language" [2].

Mobile-assisted language learning (MALL) represents "the use of smartphones and other mobile technologies in language learning, especially in situations where portability and situated learning offer specific advantages" [3]. "MALL differs from computer-assisted language learning in its use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access and interaction across different contexts of use" [4].

"The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment" [5]. Internet of Things is "enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies" [6]. "From anytime, anyplace connectivity for anyone, we will now have connectivity for anything" [7].

2.2 Uses of mobile technology in the foreign language class

Next, we try to present various ways of using mobile devices as learning tools in foreign language classes, considering the context of the Internet of Things.

Use the group chat and online discussion forum features. Currently, there are many online discussion forums and group chats around the world, such as WhatsApp. Teachers can encourage student participation in one of these forums or groups in order to determine them to participate in conversations and to gain the ability to communicate in the foreign language. More than that, teachers can also create an online discussion forum specific to their classes, in order to increase understanding of various notions.

Create video or audio recording. In order to promote oral communication, teachers could ask students to use audio and video recording features provided by most mobile phone and record short videos or audios with their homework solutions. Also, teachers can use these features to offer assignment solutions and their feedback to students.

Use quizzes. In order to adapt the teaching activities to their students, teachers need to evaluate the students' understanding of the concepts newly taught. Thus, for example, at the end of the course, teachers may ask students to use their mobile phones in order to take an online quiz.

Use of QR codes. Quick response (QR) codes can be used by the teacher to provide students with fast links to further resources, quizzes, solutions to quizzes or homework, etc. Students can access all these by using an app on their mobile phone that scans the QR code.

Use speech recognition apps. In order to practise speaking and accurate pronunciation, students could use various apps with speech recognition features. Thus, for example, there are apps that give instant feedback on user speaking and pronunciation skills. Also, students can use assistants such as Siri (Apple), Galaxy (Samsung), Alexa (Amazon), that already allow users to give commands to various devices (e.g., things in IoT) via language recognition and synthesis software.

Monitor student's attendance. This is another great way to use mobile technology in the classroom. The teacher can easily take real-time attendance, using specific apps.

Perform various education-related tasks. Various studies reveal that students were keen at the possibility of checking grades and news, accessing course contents, performing assessments, taking quizzes, contributing to classroom, scheduling, emailing, etc., some of which could be performed even outside the classroom, using only their mobile device.

Help students with disabilities. Modern mobile devices can contribute to a better inclusion of students with disabilities in the language learning class. Thus, an increasing number of new services and apps offer various solutions for this special category of students, such as accessibility features and services already integrated in mobile devices, (i.e., screen readers, screen magnifier, audible or tactile feedback, voice recognition, etc.) or apps (e.g., text to speech, object recognition, etc.).

Use wearable devices. The development of sensors, various intelligent devices, etc. that can be viewed as things in Internet of Things, can communicate with apps with little or no human interference,

thus offering new and innovative facilities. For example, using wearable technologies, such as smart glasses, one could develop very interesting augmented reality apps for language learning classes.

But how mobile technology can be used in the classroom and what can be done also depends very much on the user's creativity.

2.3 Benefits

The findings revealed that the use of these technologies brings various benefits that allow students and teachers to ease the learning and teaching process.

We can highlight some benefits for students:

- easier and faster communication, allowing easy interaction with teachers and fellow students
- immediate and portable access to information, for example, students can access their course materials at almost any time and any place
- better and more comfortable studying
- improved learning process.

The powerful features of the mobile technology could be creatively used by teachers to achieve greater results in their work. Some of the benefits that teachers could have are the following:

- faster access to information
- engaging a larger audience to the topic being learned by including into their classes various exciting, motivating and interactive activities, such as games or other fun activities
- the opportunity to integrate, as a part of language teaching classes, various tools (many of which are free) in order to improve students' language acquisition and their communicative skills
- the possibility of relieving teachers from various tasks, such as administrative tasks, time-consuming tasks
- improved teaching process.

2.4 Challenges

But, for the IoT to become truly transformative in the language teaching and learning process, a technical as well as a pedagogical shift is needed. Teachers face a series of complex challenges related to the continuous development of technology. Thus, according to [8], "teachers (even digital natives) need to be trained and shown how to use the technology they are so used to in order to teach… Our students likewise must be shown how to use technology to support their learning. The fact that they ordinarily use smartphones and other tech gadgets does not mean they know how to use them to learn. Teachers should be available to show their learners how to engage with these technology tools and devices for learning purposes".

Although mobile devices are seen as a supportive tool in education, conversely, various studies examine whether mobile devices can be considered disruptive technology. Research investigating the relationship between mobile device use and academic performance is limited. However, some researchers draw attention to this link, suggesting that high level of mobile devices use has a negative effect on students' academic performance. On the other hand, they also admit that even in the classrooms where the mobile devices are not allowed, younger generations use mobile devices anyway. Apart from these facts, some propose to go with the flow, but make proper use of mobile devices in order to contribute to student learning and improved academic performance.

3. Future work

Future MALL systems could benefit from the new development in the Internet of Things, and also, in machine learning and artificial intelligence. For example, the rapid emergence of augmented reality presents very interesting potential applications for foreign language learning, and not only.

In what concerns the future directions for research and development related to MALL, the following questions could be considered.

- How are we preparing for the impact of new innovative technologies on foreign language learning?
- What additional skills will need to be developed?
- What impact will all this have on the roles of teachers?

4. Conclusion

With the increasing popularity of mobile devices among teachers and learners, there are new opportunities for foreign language teaching and learning in a different way. We provided some insights

into various ways by which both teachers and students can creatively use new technologies in the language learning activities, even outside the classroom.

According to the results of various researches conducted worldwide, highlighting that the adoption of new available technologies could bring uncountable possibilities in foreign languages learning and teaching for students and teachers, stakeholders in education should analyze the adoption of these technologies as soon as possible in the educational process.

References

[1] Sharples, Taylor, & Vavoula (2005), "Towards a Theory of Mobile Learning", Proceedings of MLearn 2005 Conference, 25–28 October, Cape Town, South Africa, 2005

[2] Beatty, K. (2003). "Teaching and researching computer-assisted language learning". New York: Longman.

[3] Kukulska-Hulme, Agnes (2012). "Mobile-assisted language learning". In: Chapelle, Carol A. ed. The Encyclopedia of Applied Linguistics. Blackwell Publishing Ltd.

[4] Kukulska-Hulme, A., & Shield, L. (2008). "An Overview of Mobile Assisted LanguageLearning: From Content Delivery to Supported Collaboration and Interaction". ReCALL, 20(3), 271-289. https://doi.org/10.1017/S0958344008000033537

[5] *, "Internet of Things Defined - Tech Definitions by Gartner". (n.d.). Available at: https://www.gartner.com/it-glossary/internet-of-things/

[6] *, Internet of Things Global Standards Initiative. International Telecommunications Union, 2012.

[7] *, ITU Internet Reports, "The Internet of Things", November 2005

[8] Adeboye, D. (2016). "Digital Pedagogy, Then Technology!", Available at: https://elearningindustry.com/digital-pedagogy-education-technology