MOBILE ARTEFACTS AND LANGUAGE TEACHING, THE EXAMPLE OF THE SPOC+ PLATFORM

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ABSTRACT

Devices which are used for mobile learning may be different and change over time, but the notion of mobility in all definitions is the only thing that does not change. With the progress in technologies and tools, teaching methods have to be updated too. In this article, the pedagogical and technological aspects of SPOC+ is investigated as a new mlearning platform. In this way, the platform is based on the SPOC, NLP tools and MIRTO project.

KEYWORDS

SPOC, NLP, MIRTO, mLearning, SPOC+, FLE

1. INTRODUCTION

Mobile devices such as smartphones and tablets that are the most widely used digital technology in the world (Bernacki et al., 2020), lead to reshaping learning and teaching by supporting, developing and enhancing course content, learning activities and student interactions with instructor, peers and learning content (Wu, 2014). Mobile learning is a growing area of academic interest by the rise and reach of mobile technologies. Mobile technologies are also more convenient for students as it corresponds to their daily use of mobile in everyday life (Sulisworo & Santyasa, 2018). A complete system of learning must combine technological advances and the facilitation of the teacher's tasks (who is not always an expert in the computer field) while at the same time bringing the possibilities of new technologies such as the use of Natural Language Processing (NLP) to enable continuous learning anytime, anywhere (Liu & Chen, 2015). Technologies break down many of the limitations and barriers of traditional teaching and promote individualized learning, feedback and interaction with the learner (Ahn & Lee, 2016). Small Private Online Course (SPOC), also known as the "post-MOOC[1] era" (Chen, 2019) has been created by professor Armando Fox (Fox, 2013) in 2013. It is an online course with a clear pedagogical objective, which suggests a form of formal registration (Kaplan & Haenlein, 2016) with a limited number of learners that allows for a personalized follow-up by the teacher, and learners, learn better in SPOC rather than MOOC environments (Fox et al., 2014).

As SPOC stimulates learners' interest in learning and encourages their participation, it is more attractive than traditional classrooms (Chen, 2019). Up to now, many of the educational theories and practices of SPOC have been implemented (Fox & Patterson, 2013), nevertheless, SPOC pedagogical case studies are used in renowned universities (Li et al., 2019).

As presented in our article (Asgari & Antoniadis, 2020), SPOC+ integrates SPOC and NLP tools for language learning, in this article we will examine the structure and functionality of our platform in more details. The main purpose of this study is to present a complete system for French language learning in the pursuit of the MIRTO[2] (Georges Antoniadis & Ponton, 2004) platform on mobile devices with modular tools.

[1] Massive Open Online Course
[2] Muti-Learning Interactive through Text and Oral Research (in French Multi-apprentissages Interactifs par des Recherches sur des Textes et l'Oral)

2. MOBILE LANGUAGE LEARNING

Nowadays language learning with mobile artefacts is so important because on one hand, second language brings considerable advantage for intellectual development (Diaz, 1984), and on the other hand education in the mobile age offers a way to extend the support of learning (Sharples et al., 2010). It was shown by Moura and Carvalho (Moura & Carvalho, 2009) that learners' attitudes and perceptions towards the effectiveness of mlearning in French language skills such as writing and reading are improved through the use of mobile phones and an increase in student motivation and satisfaction in individual and collaborative learning was seen. In the same line, SPOC+ proposes a new approach to learning the French language on mobile artefacts, a concept that did not exist before.

3. SPOC+

Our platform, SPOC+, with the base of SPOC, is in the continuity of the MIRTO project which was developed by Antoniadis.

The three key aims of MIRTO are:

- The set of NLP software resulting from scientific research and laboratories.
- The diversity and richness of textual and oral corpora.
- A set of NLP functions (NLP function is obtained from NLP software) (G. Antoniadis, 2008).

SPOC+ is designed with the same aims as MIRTO, a reliable and automated tool which is also easy to use by teachers who do not necessarily have computer skills. As MIRTO, our platform is modular and can accept new functionalities and updates according to advances in the NLP domain. Apart from our presentation site, SPOC+ consists of a web interface developed in the C# language with the ASP.net framework and SQL databases, intended only for the teacher and the administrative body and a mobile application developed on the React Native platform to be used on smartphones with Android or IOS operating system. The mobile application uses different APIs to communicate with the server.

We integrated the open-source and Windows compatible morphosyntax analyzer TreeTagger[3] with a reliability rate of 95.7% (Mars, 2016) which automatically provides texts with holes or multiple-choice exercises for 33 different labels such as adjectives, adverbs, determinants, interjections, nouns, numbers, interjections, prepositions, pronouns and verbs. According to these items and its pedagogical purpose, teacher can automatically create exercises and generates activities for learning the French language with any type of text he wants to use or refers to our text database. Even if it was necessary, teachers can take advantage of previous texts which have been updated by other teachers. Exercises that are generated automatically can be corrected automatically. We have designed our platform as simple as possible to allow the teachers who are not computer specialists to use the NLP and Computer-assisted Language Learning (CALL) tools and focus on the purely pedagogical aspects. If teachers are interested, they can use and propose exercises and activities that require manual correction.

A chat module is integrated into our platform to be used between each learner and his teacher; this tool allows a personalized follow-up. The Forum module is intended for collaborative work between learners of the same course and their teacher who is the forum moderator. The Forum module can be used to promote project-based learning.

We have added Google Analytics4 allows gathering usage data from each screen and buttons of SPOC+ mobile application, and Google's Firebase5 tools such as In-App Messaging and Cloud Messaging which will allow us to send targeted notifications which are easy to use for teachers or administrative members. The use of tracks will allow the teacher to adapt and improve their teaching strategy. The complete architecture is shown in figure 1.

[3] http://www.cis.uni-muenchen.de/~schmid/tools/TreeTagger/
[4] https://analytics.google.com/
[5] https://firebase.google.com/

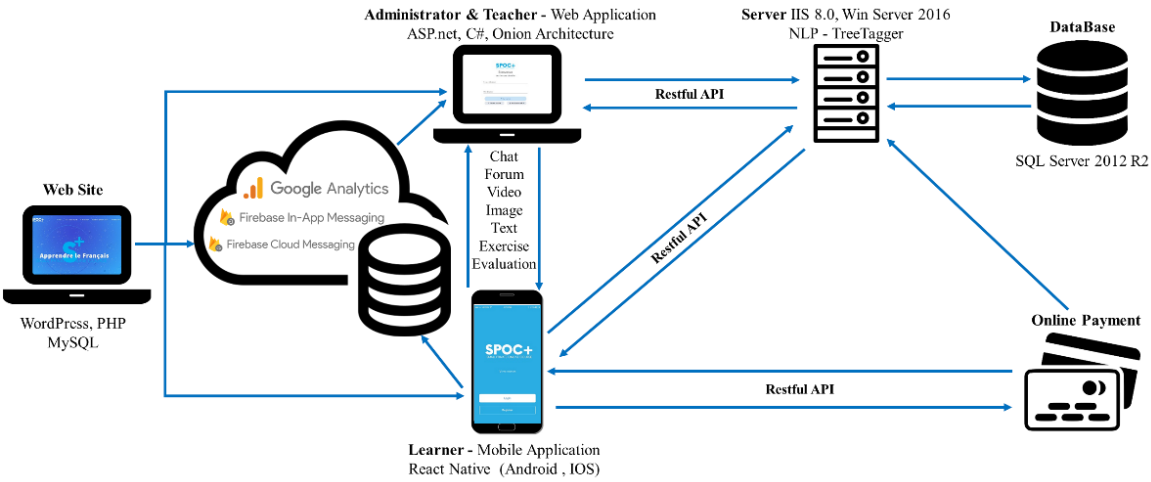

Figure 1. SPOC+ complete architecture

4. SPOC+ PEDAGOGY

Our project-based pedagogical approach is based on John Dewey (Dewey, 1986) work. According to Stephanie Bell (Bell, 2010) "Project-Based Learning (PBL) is a student-driven, teacher-facilitated approach to learning". The strategy of project-based pedagogy allows students to face a real situation (Biasutti & EL-Deghaidy, 2015) and promotes self-regulated learning in online mode (Bagheri et al., 2013). SPOC+ learners will be selected on pedagogical criteria beforehand to form a homogeneous group of learners of the same level. In our platform each course is divided into several lessons which includes a detailed pedagogical sheet made available by the teacher for the learners to view before the beginning of each lesson. For his pedagogical strategy each teacher could add videos, PDF and JPG files, soundtracks and texts for each lesson of his course. The videos made by the teacher, with a maximum duration of 15 minutes for each video, can be uploaded via the web interface dedicated to teachers. To allow learners to concentrate on the pedagogical content and avoid destabilization by the change of software (application) to perform the tasks required in their pedagogical processes; all videos, images, PDF documents, soundtracks and texts are presented directly in the SPOC+ mobile application, without the need of any third-party software. For the same purpose, the use of the chat and forum module is done directly in the SPOC+ mobile application. With the integrated chat and forum modules in our platform, the teacher not only transmits information, but also acts as a mentor, facilitator, tutor and mediator throughout the teaching process (Frank et al., 2003) to promote project-based learning. We have prepared a 4-week program to teach the French language to a pre-selected adult audience who decided to start B2 level based on the criteria set out by the CEFRL[6] in a non-French speaking country. At the end of the course, all data will be collected by two questionnaires on a mixed methodology (quantitative and qualitative) on learners' attitudes towards and perceptions of the use of SPOC+. A System Usability Scale (SUS) questionnaire defined by Brooke (Brooke, 1986), to gather users feedbacks on the ease of the use of our platform, and a second questionnaire to evaluate the pedagogical perception of our mobile learning system.

[6] Common European Framework of Reference for Languages

5. CONCLUSION

As it is described, our platform, SPOC+ is modular and enables the incorporation of new functionalities from scientific advances in the field of NLP as well as technological innovations, such as virtual reality and augmented reality. We have developed the SPOC+ learner interface only on smartphones, to allow learning anytime, anywhere. SPOC+ covers all four skills of learning language; listening, reading, speaking and writing. We plan to test our platform, collect data, analyze the results and evaluate the possibility of offering courses for other levels of French language learners.

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