Innovation in Language Teaching and Learning

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What do we need to make a Massive Open Online Course (MooC) for Language Learning genuinely innovative?

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Abstract. By sharing experiences from the process of making Massive Open Online Courses (MooCs) in second language at NTNU, this paper aims to raise awareness about the need for improved technology solutions with a critical look at how course developers can build more innovative and interactive language MooCs within the frame of self-instructed courses using new convergent technologies such as Web Real Time Communication (WebRTC).

Keywords. MooC, language teaching and learning, oral interaction, WebRTC technology

1 Introduction

In 2005, George Siemens argued the need for a new theory of learning in the digital age [1]. In the past decade, access to worldwide information in the form of continuous streaming from social media and fast developing new convergent technologies have radically changed our way to connect and interact with the world around us and our approach to learning. New emergent technologies offer different models and structures to support learning, and disrupt the notion that learning should be controlled by educators and educational institutions [2].

Following the enthusiasm for "The year of the MooC" (Massive Open Online Courses) as highlighted in a well-known article in the New York Times in 2012 [3], we have seen a fast-growing interest in MooCs connected to language learning. For example, the MooC provider FutureLearn enrolled over 370,000 students on the preparatory course to the English language proficiency test, IELTS. This is so far the biggest MooC in the world [4].

While the general research literature on MooCs is fast-growing, the emergent body of specific research literature on MooCs for language learning is still very limited [5, 6]. MooCs is a 'hot topic' in the context of online teaching and learning research and practice, with numerous ardent supporters as well as fervent opponents.

Among the arguments set forth by the opponents, high dropout rates have, for instance, been interpreted as an indication that barriers to persistent learning in MooC environments are present and are a steep wall to climb and conquer for course developers, independent of the subject field [5]. The wider lay-audience of the general public has also argued that this situation could well manifest a symptom of an

exaggerated hype around MooCs and an overrated and overestimated focus on supposed teaching and learning innovations [7, 8].

This paper is framed within the field of second language didactics and is a result of my work on two Language MooC projects at the Norwegian University of Science and Technology (NTNU). The first project (2016) was a collaboration with the Ministry of Foreign Affairs to produce a self-instructed introductory Norwegian language MooC on Open EdX for the foreign embassy employees around the world. The second project (2017-18) was a wider and updated version of the Norwegian MooC, which has now been launched internationally on FutureLearn.

In this paper, I wish to readdress the topic of innovation in language teaching and learning that supporters of MooCs and providers of MooC platforms predicate. Working with both Open EdX and FutureLearn, I experienced that the provided technology can limit the possibilities for a developer to construct a MooC for language learning, defining and somehow constricting the teaching approach in a more traditional manner. Specifically, I will try to raise awareness about the technological limitations for language MooCs' development as presented by most MooC platform providers, with special attention to oral production and interaction. I will then address the need for improved technology solutions, with a critical look at how MooC platform providers and course developers can build more innovative and interactive language courses by integrating new convergent technology such as Web Real Time Communication (WebRTC) in order to promote genuine oral interaction, especially in the case of self-directed learning.

2 Are MooCs really just a hype?

The challenges facing the higher education (HE) sector in meeting technology are multiple, the foremost being how to adapt a static institutional system and traditional teaching and learning patterns to the new dynamics offered by technology services. The paradoxical result is that even in the presence of technological availability for implementing newer and more effective learning processes, historical and cultural barriers from a bygone era of education philosophy and practice create hindrances to innovation processes [9 - 11]. This creates somewhat dysfunctional learning and teaching environments where technology is applied, yet not fully understood, nor is it used to its fullest [ibid].

The journey to real innovation in MooC developmental technology is just at its beginning [11]. In the words of George Siemens [11, 12], there are two types of MooCs: cMooCs and xMooCs. The "cMooC model emphasizes creation, creativity, autonomy and social networking learning" while the xMooC model emphasises "a more traditional learning approach through video presentations and short quizzes and testing. Put another way, cMooCs focus on knowledge creation and generation whereas xMooCs focus on knowledge duplication" [ibid.].

However, despite the claims of innovation, disruptive learning technology methods and a revolution in learning approaches, several meta-studies [11, 13, 14] reviewing the existing research literature on MooCs and investigating the pedagogical approaches applied seem to confirm that the pedagogical practices in MooCs are neither entirely

new nor radically innovative [14]. The general teaching setups in most MOOCs seem to rely on a classic behaviouristic teaching paradigm, with pre-produced and teacher supervised study paths and fairly linear learning sequences. Knowledge is passed on to a mostly passive audience through video presentations or streaming from classroom practices. This seems to occur both in teacher-supervised learning environments, as in most xMooCs, and in self-teaching or autonomous learning environments oriented to a more connectivist approach, as in cMooCs - the connectivist side being the student fora available on the MooC platform [13, 14].

The above-mentioned problems are certainly true for language courses as well.

3 The case of Language MooCs

With regard to the worldwide development of 'Language Massive Open Online Courses' or 'Language MooCs' (as termed hereafter), Spain and the United States of Amercia (USA) are in the lead with a solid academic legitimacy but also an extensive commercial production. It is therefore not surprising that the most prolific Language MooCs are in Spanish and English. In the rest of Europe, including Norway [15, 16], the situation is quite different and Language MooCs are often developed under the umbrella of smaller, specific research projects.

Platform selection and technical functionality vary greatly according to funding and this impacts correspondingly on the final product. The kind of Language MooCs which have been developed, whether these are meant to be self-instructed courses or tutored, also imposes specific didactical and technical choices, along with cost management strategies.

In a very first attempt to gather and categorise research on learning and teaching experiences in the emerging field of Language MooCs, Bárcena and Martín Monje have edited a pioneering and insightful meta-study that covers paramount topics relevant to any language MooC developer. The conundrum for language courses, irrespective of their possible categorisation as cMooCs or xMooCs, is defined as follows:

> "language learning is not only knowledge-based, in the sense that it requires the rather passive assimilation of vocabulary items and combinatory rules, but is mainly skill-based, in that it involves putting into practice an intricate array of receptive, productive and interactive verbal (and non-verbal) functional capabilities, whose role in the overall success of the communicative act is generally considered to be more prominent than that of the formal or organizational elements" [13].

How does the technology available on MooC platforms cater with such a challenge? Even if MooC platforms in general undoubtedly offer a considerable improvement on online language course development, the technological advancements are not sufficiently developed to meet the specific requirements of language didactics. For example, it is a fact that none of the existing platforms has embedded technology which can enable course participants to fully develop their oral interaction skills. Most of the course content relies on written interaction, with the exception of fully-tutored Language MooCs, where feedback on the participants' oral performance takes place with the aid of external technological resources such as videoconferencing. In self-

instructed courses there is neither the possibility for oral interaction nor external feedback on the platform [13, 14].

3.1 Oral interaction issues in Language MooCs

According to the Common European Framework of Reference for Languages (CEFR), which is increasingly also being used in countries outside Europe, the categorisation of the language learner and user's linguistic competence is based on real-life language use and grounded in interaction and co-construction of meaning. Activities are presented under four modes of communication: reception, production, interaction and mediation in written ***and*** oral context [17].

In the CEFR, *proficiency* is a term encompassing the ability to perform communicative language activities stated as "*can do-s*", while drawing upon communicative language competences (linguistic, sociolinguistic, and pragmatic), and appropriate communicative strategies [ibid.]. When one of these primary competences fails to be represented within the language learning environment, as for instance in the case of the technological inadequacy of MooC platforms to support solutions which cover oral production and interaction, a question arises concerning the learner's actual possibility for fully developing the range of linguistic competences necessary in order to master the target language. Similarly, a concern becomes apparent about the integrity and validity of the language course and the possibility for future assessment and accreditation. These are indeed pressing demands which need to be addressed by MooC-developing institutions and MooC platform providers for and within HE.

Regarding the allegedly interactive environment present on MooC platform solutions, there is a growing consensus that "most of the MooLC (language MooCs) initiatives don't offer a highly interactive environment where the learners are interconnected to a language learning community and collectively build their language skills" [14]. Learners are still studying language in a traditional way, following courses based on a cognitive behavioural pedagogical model with extended use of instructional videos and pre-formatted learning sequences [14, 18].

Even in the case of two of the largest and most successful MooC providers, Open EdX and FutureLearn, platform limitations in structure and functionalities are present. Especially, FutureLearn is constricted by a rigid platform setup and few functionality options (video, article, audio, quiz and poll/discussion). The underlying connectivist pedagogy, enhanced in the form of supported collaborative learning tasks among student participants, also seemed to be limited too frequently by the technology options available on the platforms and solely bound to discussion fora. The inspirational vision of connectivist MooCs is too often proving elusive. While it is possible to follow the course participants' interaction on tutored Language MooCs, it is very difficult to monitor whether the course participants will interact with each other in a self-instructed Language MooC [18, 19]. Neither is it possible to know for certain whether the participants will be able to build a learning community outside the platform and beyond the platform resources by utilising external digital services for language learning to instigate collaborative knowledge building [19]. It is important to note that many Language MooCs are indeed self-instructed and based on the concepts of autonomous learning. In this case, platform technology is not necessarily synonymous with better

teaching or learning. For instance, even the use of synchronous tools for written communication on MooC platforms can be counterproductive. It is indeed extremely difficult to foster high-level cognitive interactions in long multiple-threaded forum conversations on a MooC platform; it is even more difficult to keep track of participants' actions when compulsory tasks, based on communicative or collaborative tools, are external to the platform [18, in 13, 19]. *Who* is doing *what*, *why* and *how* are crucial questions to ask when in the process of learning a language. It is already a challenging task for the course facilitator/instructor trained in language didactics to create a sense of logic communication flow on the platform for tutored Language MooCs. It could be a virtually impossible task for the well-intentioned but not necessarily trained volunteer mentors and curators possibly emerging from the learning community of a self-instructed Language MooC.

Is it then possible to create better learning environments on MooC platforms which can support the development of oral interaction so critically important to language teaching and learning?

4 Towards better technological solutions

It is not easy to answer why such an important feature like oral interaction on Language MooCs has yet not been a priority for MooC platform developers. Especially so, since the technology which could make this possible is ready available and in use on popular Language Exchange Apps like *Bilingua*, *HiNative* and *HelloTalk*.

Language Exchange Apps like the ones mentioned above offer the opportunity to communicate with other language learners as well as native speakers through chat and videoconferencing. Using matching algorithms, they select the best possible learning matches to your profile. As a common denominator, these apps display integrated learning tools like translator, vocabulary lists and grammar checker, but foremost they make language learning a pleasant experience keeping learners motivated. *Bilingua* has even included gamification features in the app with a reward system to stimulate language learning through gaming and competitions among learners.

Would it be possible to recreate this kind of productive and interconnected learning environment on Language MooC platforms? Would it be possible, for instance, to integrate videoconferencing technology on OpenEdX or FutureLearn and open up for oral communication directly on the platform, without having to rely on external programs and resources?

4.1 WebRTC technology

Videoconferencing has traditionally required installing a dedicated application, such as Skype. In 2011, Google released WebRTC (Web Real Time Communication) as an open source project to bring video conferencing to browsers. As a result of its addition in popular browsers such as Chrome and Firefox, numerous web-based videoconferencing services were launched.

WebRTC enables real-time communication over peer-to-peer connections and applications such as video conferencing, file transfer, chat, or desktop sharing without the need of either internal or external browser plugins or external software. As an example, Appear.in was launched in Norway by the national telecommunication company Telenor as an online collaboration tool that supports videoconferencing with multiple participants (up to 12) with no required registration. At the core of its functionality is WebRTC.

In order to integrate this technology on a MooC platform, the platform itself must support customisation using HTML and Javascript. An example is the Xblock-functionality on OpenEdX.

Xblocks are fully-customisable extensions or plug-ins that add functionality to OpenEdX platform and can provide interactive content to the learning objects in the course. In this case, a bespoke Xblock provides access to an external WebRTC platform through an Application Program Interface (API). The implementation of WebRTC can be done by integrating existing conferencing services. Suppliers of such services are, for instance, the American *Tokbox*, the Singapore-based *Temasys* or open source providers like *Jitsi*. These suppliers offer Javascript APIs which are used on web sites together with a "conference bridge" which browsers will then connect to in order to deploy videoconference functionality. At NTNU, we are currently experimenting with building XBlocks to implement WebRTC (by using *Jitsi*) on our Open EdX installation, so that we will be able to provide Language MooCs with real-time oral interaction for our learners.

It is, however, important to underline that even in the case of Open EdX, this is not something course designers will be able to do on their own. This bespoke functionality requires the dedicated efforts of a team, including computer programmers and web designers, and it comes with a cost that will impact on the project budget. Nonetheless, OpenEdX is the only platform that allows the necessary customisation to integrate this technology.

Unfortunately, at the moment, FutureLearn does not offer course developers the possibility to include such convergent technology for tailoring learning objects' functionalities, as the platform is rigidly preformatted and does not support custom extensions. In this respect, any attempt to include oral interaction in the course design of self-instructed language courses on FutureLearn is currently precluded.

4.2 WebRTC for Language MooCs

Integrating ad hoc technology to enable oral interaction on MooC platforms is a first step. Most crucial, though, is integrating the technology in the language course design. How is it possible to use WebRTC technology in a meaningful way for large classes that are common to MooCs? And how can such activities be assessed fairly and equally?

The implementation of WebRTC on Language MooCs could give rise to different learning scenarios and entail different levels of cooperation. In the following, I will describe some possible courses of action that can work on Open EdX, as this is currently the MooC platform which offers the best technological functionality.

4.3 The participants

The first logical approach will be to match the existing course participants so that they can start to practice their oral skills with each other. In the matching process different variables must be considered as with Language Exchange Apps mentioned in previous paragraphs. Such variables include personal interests, level of proficiency in the target language, time of dedicated effort a week and different time zones.

In language didactics, there is an unequivocal consensus that small groups work better than large classes. The platform should therefore include functionality for creating smaller learner groups, such as "cohorts" on Open EdX. Cohorts will then be assigned language tasks according to their level of proficiency. It will be possible, for instance, to create guided video-chats where learners have to solve problems or enact a role play in the target language.

In order to foster genuine oral interaction on Language MooCs, though, the pivotal feature of the course design will be to open up for interaction with native speakers. Only through feedback provided by native speakers can a language learner fully develop his/her range of communication skills. It is then necessary to build a database of participants which comprises native speakers willing to learn and help others learn languages. But how to recruit such participants?

On Open EdX, for instance, it is possible to recruit in interdisciplinary ways, from other courses on the platform, during the enrollment process. When the participants receive their enrolling mail to a course, it is possible to ask them whether they want to join the platform's tandem language learning community. It is also possible to create a separate enrollment dedicated only to the platform's tandem language community. This could have been displayed as a platform feature on an institution's main page. Educational institutions could cooperate with local community initiatives, or themselves initiate local community projects, like inviting retired language teachers to the tandem community. In this way, language courses can be guaranteed the necessary experience of native speakers and at the same time the language tandem project can have a positive impact on a segment of society whose resources are underestimated.

4.4 Assessment, certification and accreditation

Certification and accreditation are notoriously a challenge for MooCs. In Language MooCs, I think the challenge is even greater.

Utilising existing technology and integrating functionalities on MooC platforms to support linguistic oral interaction have simply not been a priority for MooC providers so far. However, this is certainly something that they will need to take into consideration in the future, especially when having to front the pressing demand for course accreditation in the HE sector. How is it possible to give credits or provide certificates of accomplishments when a course is simply not teaching the learners one of the most important skills they need to know when learning a language?

When integrating WebRTC in Language MooCs, new forms of assessment can come to light and offer interesting solutions, particularly in self-instructed courses.

Open Response Assessments (ORA) are, for example, flexible assignment types on Open EdX in which learners submit different text responses to open questions or assignments. Responses can be submitted in different file formats and learners are guided through a series of assessment steps that can include a training step, peer assessment, self-assessment, and even staff assessment in fully tutored courses. In self-instructed courses, course designers set forth constraints and conditions and can define the assignments in ORA. For instance, a learner can be required to deliver 30 to 45 minutes of work/week in oral communication skills. In this case, each video conference session is recorded in the MooC platform's analytics system, which means that the platform registers the learner's participation, and the learning task is then marked as completed for future certification/accreditation. In the same way as other language exercises, it will be possible to integrate several video conferences in the curriculum and adjust these according to language learners' level and progression.

What ORA functionality allows particularly in self-instructed courses is the emergence of a learning community, where learner's tasks are not simply collected and stored in analytics, as happens with regular multiple-choice or predefined exercises, but it is an intrinsic part of a learner's development. The ORA's cornerstone on a Language Mooc is peer-to-peer assessment. The learner is required to perform a language task and get peer evaluation on his/her performance while at the same time having to evaluate the responses of other course participants. In addition, the learner also gets evaluation from his/her *virtual tandem partner* (VTP), that is, the native speaker or speakers with whom he/she regularly engages in conversations. In this way, the scaffolding so crucial to language learning [20] fluctuates organically between the expert support given by the native speakers and the peer support presented by other course participants, offering the learner the possibility to explore and test language skills in his/her zone of proximal development [ibid.]. In the same way, the rigid boundaries between informal and formal assessment fluctuate; the learner's assessment of his/her own achievements is continuous and progressive thanks to the feedback from the VTP, the learning community and the automated analytics functionality on the platform.

Only when platform functionality and course design are able to cover for all these aspects can a Language MooC genuinely claim to foster language learning.

6 Discussion and conclusion

The need for successful Language MooCs, which can present learners with quality ad hoc technological solutions and appropriate language didactics, is high, due to multilingualism and multiculturalism being paramount aspects in our modern globalised society. The journey to reach that target is just at the beginning; there are still issues which are neither being fully addressed nor perhaps fully understood in the MooC-platform providers' community.

Language MooCs have to deal with the same ontological, conceptual and practical challenges of regular MooCs, like the evolving nature of teaching and learning in digital networks, the redefinition of the teacher's role as facilitator, time and implementation costs, as well as assessment and accreditation issues. In addition, Language MooCs

necessarily face specific challenges intrinsic to language didactics, such as how to enable oral interaction on the platform among the course participants but also within the authentic context of oral communication with native speakers. This is particularly important for self-instructed Language MooCs. However, most Language MooCs so far do not offer oral interaction functionality.

Without pretending to have a solution to a complicated matter, which involves several levels of theoretical and technological understanding, I wish, however, to conclude this paper by mentioning that it is indeed possible to utilise existing convergent technology such as WebRTC and integrate functionalities on MooC platforms to support linguistic oral interaction. This aspect has simply not been a priority for MooC providers so far, but it certainly is an issue which needs to be addressed, especially concerning the pressing demands for course accreditation in HE. MooC platform providers and language course designers could find inspiration in their search for a solution to this problem by looking at developments in non-MooC language learning environments, such as in the case of Language Exchange Apps.

Implementation of WebRTC technology on MooC platforms could challenge the classic teaching paradigm still predominant even in advanced technological learning environments, and could open the way for assessment processes more suitable to learning in the digital age.

Research in this specific field is not yet available, and an array of research possibilities therefore lie ahead for genuine innovative language didactics in MooCs.

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