3D-MOOC – FINAL REPORT

Brief synthesis of the results

The 3D-MOOC project enabled to identify interesting research directions which gave rise to initiatives in the educational field, for both ENS Bretagne and TELECOM Bretagne (an e-Fran project, for instance), with the support of the MEN, the French Ministry for Education (see Appendix 1). The role of the associated SMEs was limited to the content provision (including 3D data). In the framework of this project, the 3D aspect had to be understood as a potential dimension for in a more general seed library supply. Here, ''seed'' (sometimes also designated as ''grain'') means a ''pedagogically self-sufficient video unit''. Seed units may include 3D data formats, but such an option is not central. Nevertheless, it was crucial to have a sufficient number of seeds concerning the chosen topical in order to faithfully deploy the MOOC concept, as sketched below. The second part of the research program of the project started when we were able to have a sufficient number of seeds. During this part, various pedagogical scenarios, options and tools were created, anticipating future courses in a MOOC mood (more typically SPOCs). A MOOC large-media-based courses was indeed the final perspective of the project.

Nowadays, the semantic plurality of the notion of MOOC is difficult to circumscribe. Many variations are still considered of the family of MOOC, although they cover more specific uses. 3D-MOOC project helped also to clarify these uses, through two approaches: a first kind of MOOC (ENS Bretagne) and a second related more to a SPOC use (TELECOM Bretagne). The latter is rather reserved to more restricted communities, as a class, a school, a museum, a society organized around a presentation opportunity, in groups or individually, in situ or remotely. In this second phase of the project, we targeted seed-based teaching practices aiming at building a course, as a concatenation of seeds. Put it differently, the objective was to offer the necessary components for setting up such classrooms; but also, to make it available to a community of students, in a more standard MOOC mood. The system developed by TELECOM Bretagne (Computer Science Department), subject of further promotional and valuation actions today, offers both options. In fact, one can both create the layout in the same narrative flow of any type of seeds (video, audio, image, text) and configure it for an on-line use, at will. In other words, students can review the course or stimulate their curiosity through ad hoc pedagogical complements, provided by the creator of the course or generated by ''intelligent'' interaction with the system; they also may use own seeds to set up tailored presentations. Without boring or excessive technicality, the system allows the creation of MOOCs/SPOCs able to be used within educational institutions, avoiding to teachers to go through expensive and impractical MOOCs platforms (as FUN, Coursera, edx, OpenUpEd, EduLib, etc.) to build their courses. They also can build courses collectively, share them with colleagues and generally modify them along the pedagogical circumstances.

The second key aspect of the research program concerned a first evaluation of the course-building system developed. At the end of the project, we could invoke enough material to allow significant experiments on the basis of an evaluation grid. The main task was the assessment of future teachers,

(students of ENS Bretagne) in their appropriation and their educational use of this new tool. Some complementary evaluations concerned also learners.

In this frame, we carried out a number of experiments of SPOC type both by ENS Bretagne and TELECOM Bretagne (under the supervision of Damien Grenier for ENS Bretagne and of Ioannis Kanellos for TELECOM Bretagne). Lectures have been developed using, mainly, seeds produced during the 3D-project; they addressed various audiences: elementary school teachers in continuing education, as part of the House of Science (MPLS), primary school students, or students of a master level (Cf. Appendixes 2 & 3). A complementary evaluation session, achieved in October 2015 (Cf. Appendix 3), aimed at gathering some elements concerning a broader tool appropriation. The participants were engineer students (first and second year of TELECOM Bretagne), PhD students and professors. The goal was to have a user feedback from a public supposed to be aware of the use of digital devices (daily use of such tools in active learning projects, as the ones developed at TELECOM Bretagne). They all responded to a call specifically for this simulation exercise; they had no knowledge of the proposed system or the evaluation mode. This phase was complementary of the work carried out at the ENS Bretagne.

Finally, this work resulted in publications: a collective publication has already been presented at the conference VAMCT 2015 (http://vamct.syros.aegean.gr/2015/aims-scope.shtml); a version of this communication will be soon published in the International Journal of *Mediterranean Archaeology & Archaeometry* (www.maajournal.com; last issue of December 2016 or first of 2017). Another publication tracing the possibilities of educational mediation in the developed system was presented at the symposium GLAT 2016 (https://conferences.telecom-bretagne.eu/glat-brest2014/programme: "Educational and Cultural Mediations ocus on Learners: A Tool to Generate Adaptive Virtual Courses."); it will appear in the Proceedings of this conference. The AMB system may be seeing here: http://edu3d.enstb.org/edu/web. It is currently the subject of a projected evaluation plan through a partnership with the MEN (creation for high school students). Indeed, the AMB system led to an audition by the Ministry of Education MEN (Appendix 1) which was very well received. We hope that a more extended version of its evaluation will be very soon possible. As a matter of fact, once upgrated in professionalism (concerning information security, scalability, responsiveness, respect for ScoLOMFR standard, etc.) the MEN wishes to include a version of the solution proposed in this project to its educational portal Éduthèque (http://www.edutheque.fr/accueil.html); the idea is to provide this portal with an upstream service that can add value to the already available resources to the site (Cf. Appendix 1). In addition, a new project currently is anchored to the developed system, which consists in incorporating formative assessment capabilities (individually or by pairs), as well as between learners cooperation areas, with the collaboration Vauban high school, in Brest (Marc Le Gall, professor and referent of the academy of Rennes on CTBT). These developments will mobilize more teams of students, one at TELECOM Bretagne and another of high school students at the Vauban high school. The rendering of this last extension is scheduled to end of 2016.

Finally, the 3D-MOOC project gave rise to a pedagogical website, integrating a pedagogical tool about renewable energy: http://www.gre-en.fr/3DMOOCWEBSITE/index.html.

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Appendices
Appendix 1: Letter from MEN
Appendix 2: Télécom Bretagne evaluation
Appendix 3: ENS Bretagne evaluation
Appendix 4: Collective paper