International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:11, No:5, 2017

Conceptual Model for Massive Open Online Blended Courses Based on Disciplines' Concepts Capitalization and Obstacles' Detection

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***Abstract*—**Since its appearance, the MOOC (massive open online course) is gaining more and more intention of the educational communities over the world. Apart from the current MOOCs design and purposes, the creators of MOOC focused on the importance of the connection and knowledge exchange between individuals in learning. In this paper, we present a conceptual model for massive open online blended courses where teachers over the world can collaborate and exchange their experience to get a common efficient content designed as a MOOC opened to their students to live a better learning experience. This model is based on disciplines' concepts capitalization and the detection of the obstacles met by their students when faced with problem situations (exercises, projects, case studies, etc.). This detection is possible by analyzing the frequently of semantic errors committed by the students. The participation of teachers in the design of the course and the attendance by their students can guarantee an efficient and extensive participation (an important number of participants) in the course, the learners' motivation and the evaluation issues, in the way that the teachers designing the course assess their students. Thus, the teachers review, together with their knowledge, offer a better assessment and efficient connections to their students.

***Keywords*—**MOOC, Massive Open Online Courses, Online learning, E-learning, Blended learning.

I. Introduction

SINCE 2011 (the year of MOOC [1]), the MOOC phenomenon is gaining tremendous interest from students and educational communities across the world. The first MOOC (Connectivism and Connective knowledge) was not a platform and had no design [2]. It was based on ideas gained from the Connectivism learning theory that states the importance of connection and exchanging of knowledge between individuals for an efficient learning experience [3]. They brought the idea of creative knowledge where the learners exchange information, knowledge and resources, and collaborate to construct new content. Many types of MOOCs on the web [4]-[8] retain the two main types, the Connectivist MOOCs (cMOOCs) as was the first MOOC and the extended MOOCs (xMOOCs) as the current MOOCs. At the long of these five years, many authors proposed MOOC frameworks, MOOC platforms and new assessment methods [9], [10]. MOOC content quality is also one of the concerns of educators [11]. The current MOOCs are offered by platforms proposing ICT tools (Information and Communication Technologies) and content from the most prestigious universities that offer the opportunity to many learners across the world to follow their courses with persons sharing the same area of interest [12], [13]. The promotion of the current MOOCs shows that the basic knowledge is still needed. The MOOCs cannot replace university courses, but can improve the learning and teaching experience of both students and teachers. The learners' motivation is generally related to the novelty and variety of exercises relating to the case studies and the levels of difficulty, the grade and the accreditation of the course. Thus, the flipped classrooms approach can have more benefits for the students. In this paper, we suggest a conceptual model for designing massive open online and blended courses. The massive collaboration of designing contents for massive audience would be the ideal environment where experienced teachers can review their knowledge and share their experiences, and is also a great way for inexperienced educators to acquire new knowledge and instruction methods. The kind of MOOCs model proposed in this paper is a complementary course for the classroom course. However, the teachers are invited to collaborate to get the common concepts, errors and evaluation units. These errors help the teachers to understand the obstacles met by their student during the exams or tests. They are expected to think about the evaluation elements in the way they can assess their students. Our proposed model is intended to be applied in online system platforms as MOOC platforms. The teachers interested to the collaboration project can subscribe with theirs students in the platform. The massiveness and openness of our model depends on the teachers' motivation to bring their student to a significant and efficient learning experience. In what follows, we expose the different stages of the model and the different knowledge capitalization scenarios.

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II. The Proposed Conceptual Model

Knowledge capitalization is a process based on knowledge management methods aiming to collect and organize the know-how and experiences feedback, so it can be used and reused. According to Grundstein [14], during this process the knowledge is identified, managed, preserved, recovered and updated, and therefore, it can be reusable. Knowledge capitalization has a crucial role in education; the capitalization of the disciplines' knowledge can improve the quality of the trainings given in the institutions (mainly universities) and online (as MOOCs). The amount of information and resources

available on the web confuses the student, this latter has no more than the university's program dictated by his teacher (or trainer) to take as a base during his researches. The capitalization of knowledge ensures that the knowledge and concepts conveyed by the university programs are sufficiently precise and complete, enriched and updated continuously.

In this section, we give details about our proposed model (MOOBC: Massive Open Online Blended Course). The demarche we suggest is based on concepts capitalization of the discipline and the detection of the obstacles met by student when resolving the different exercises or evaluation units. Our model is intended to be implemented in an online system, where teachers interested in collaborative teaching and learning can subscribe and participate in the collaborative and capitalization project. Fig. 1 (showing the mapping of the objects defining the proposed model) presents the different elements' connections of our model. The teachers collaborate to set the concepts of the course, the errors, the obstacles and the evaluation units. The relation between these elements is defined as follows:

- The course is composed of concepts representing the discipline and is evaluated by the evaluation units.
- The evaluation units have terms and are classified by degree of difficulties.
- The terms of an evaluation unit describes a situation and defines a problem.
- The solution of the problem is considered as the response of the evaluation unit.
- According to their experience, teachers set a list of frequently committed errors by their students resolving the problems (the evaluation units) in traditional classrooms.
- The teachers collaborate to determine the origin of these errors and then define the nature of the obstacles and classify them into degree of difficulty.

The following points detail the capitalization and collaborative model.

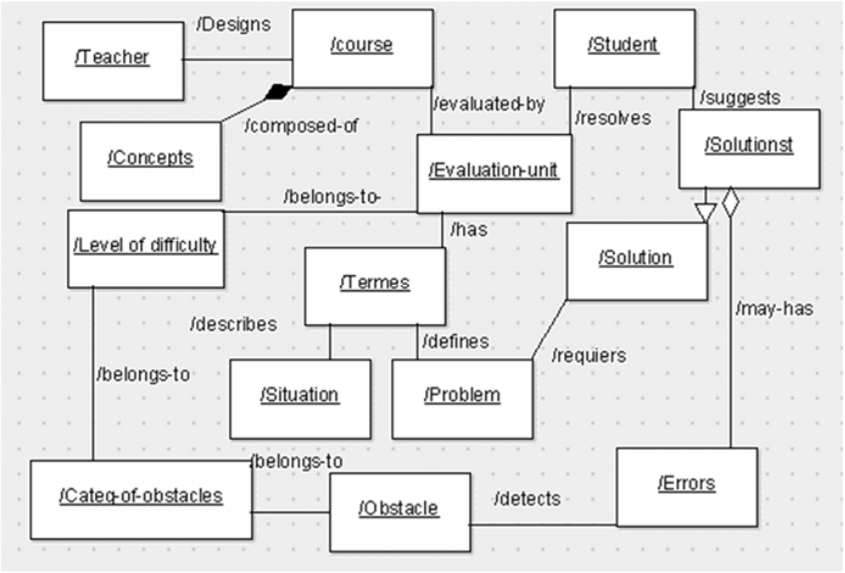

Fig. 1 Mapping of the objects defining the proposed model

A. Capitalization of the Course's Concepts

In this first stage, the teachers are invited to submit their proposals of the course summary (Fig. 2 that is the Concepts' capitalization process). They have the choice to improve existing submissions or edit new ones. After the submission deadline, the system matches the versions and delivers a temporary version, including the most cited concepts. The less cited ones are considered as conflicts. After that, the teachers are requested to comment on this version and discuss the inclusion of some conflicts. The final version is the previous version updated by the most marked conflicts. The following stages follow the same capitalization step, namely, the collection of versions, versions' matching, temporary version edition, revision of the version, and then updating and delivery of the final version.

B. Capitalization of Frequently Committed Errors

Based on the capitalized concepts, the teachers are requested to submit the frequently committed errors that are related to these concepts (Fig. 3 shows the capitalization of frequently committed errors process). Each teacher provides the formal and semantic errors separately. The formal errors highlight the obstacle of language.

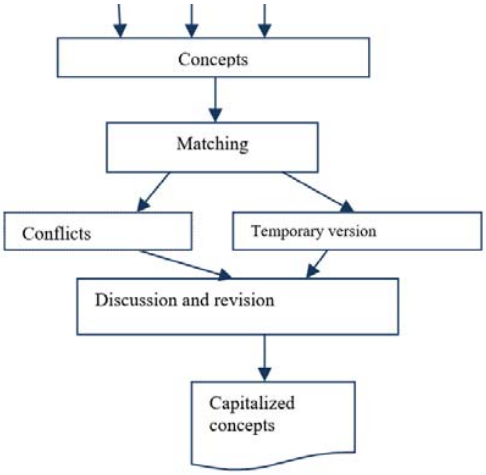

Fig. 2 Concepts' capitalization process

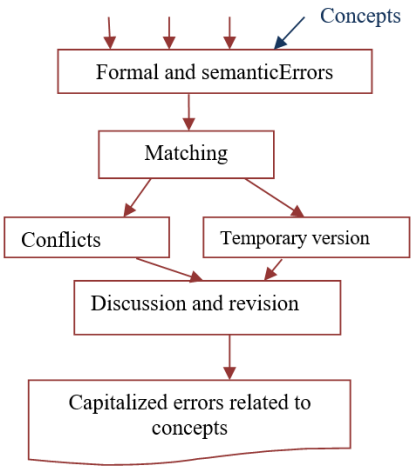

Fig. 3 The capitalization of frequently committed errors process

C. Capitalization of Obstacles' Classification

The resulting errors' base encourages teachers to think about the kind of obstacles confronted by students while resolving the evaluation units. Thus, each one of them suggests obstacles' classification criteria. The result of this capitalization is a typology of obstacles.

D. Capitalization of the Semantic Errors' Classification

In this stage, the teachers are requested to classify the semantic errors according to the types of obstacles (Fig. 4 shows the semantic errors classification process). As a result of this capitalization, each semantic error is connected to the kind of obstacle it detects. The purpose of this classification is to determine the errors' levels of difficulties. This can help teachers to classify the evaluation units according to the semantic errors.

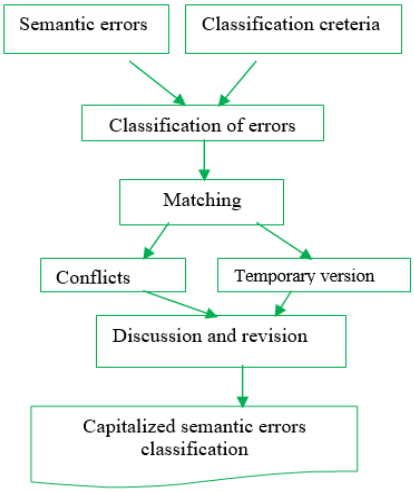

Fig. 4 The semantic errors classification process

E. Capitalization of the Obstacles' Association to Levels of Difficulty

In this step, each teacher suggests a classification of the obstacles (indirectly the semantic errors) by level of difficulty. This classification helps the teachers to choose and classify the evaluation units according to the degree of difficulty, so they can gradually assess the students. The levels we suggest are five (0 to 2, 2 to 4, 4 to 6, 6 to 8 and 8 to 10) corresponding to four exercises and a project having a high level of difficulty.

F. Capitalization of the Evaluation Units and Their Classification by Degree of Difficulty

At this stage, each teacher gives a list of restricted evaluation units (three exercises and terms of one project) and their solutions classified by the previous levels of difficulty (Fig. 5 representing Capitalizations of the evaluation units).

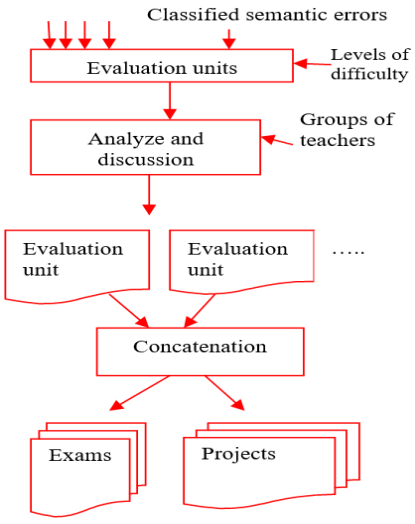

Fig. 5 Capitalizations of the evaluation units

The previous association of the obstacles to degrees of difficulty helps the teacher to better choose and classify the

evaluation units. In this stage, the system compares between the versions of evaluation units to only detect identical ones and keep only one copy for the next processing that is the selection of best evaluation units by the teachers.

First, the teachers are divided into groups; each group represents one degree of difficulty. The evaluation units of each level are devised equally to be analyzed by teachers of each group. After this analysis, the teachers of each group discuss and exchange their views about the evaluation units and then choose a restricted number of pertinent evaluation units. The concatenation of these selected evaluation units, forms examination subjects with four degrees of difficulty and projects with the fifth degree of difficulty. The number of subjects and projects is determined by teachers according to their needs and pertinence of the exercises.

G. Design of the MOOBC and Evaluation

At this stage, the teachers discuss about the design of the course, the disposition of the resources and activities. The formal errors capitalized can be transformed on quizzes and used as the first assessment. According to the capitalized concept, the teachers can design video lecturers introducing or resuming these concepts, as is the case in MOOCs.

H. The Launch of the MOOBC

After the MOOBC design stage, the teachers determine the period of launching the course. Each teacher recommends their students to enroll in the MOOBC. Firstly, they follow the course, and do the quizzes that are corrected automatically. After that, they resolve four evaluation units of different difficulties. According to the results obtained in the previous evaluation, the students with unsatisfactory results can review the course and consult their teacher or online teachers. After the remediation step, to work on different projects, the students are grouped according to their results; the members having the best results are grouped with others having medium or insufficient results to help those struggling to work better. With the exception of the quizzes, the students' responses are evaluated by the teachers participating in the MOOBC creation. Each teacher has the same number of responses, as usual, but they can be students of the other teachers. The massiveness of the MOOBC is controlled in a way that anyone can enroll in the course and do quizzes and probably review the exercises, but cannot be inevitably assessed by the teachers. However, teachers (unless they did not participate in the MOOBD) from other universities around the world can subscribe, together with their students, and try the experience. The result of the students and intervention of new teachers can raise the necessity of the review and update of the course's concepts and evaluation units.

III. Conclusion

In this paper, we suggested a conceptual model for Massive Open Online Blended Course where teachers from different universities around the world can collaborate to realize a better learning experience for their students. The demarche we propose includes a set of knowledge capitalization scenarios, where teachers contribute to the construction of the concepts and evaluation units of the MOOBC. According to their experience, teachers can determine the frequently committed errors by their students that reflect the obstacles they met in resolving the exercises or any element of evaluation. The evaluation elements are classified by degree of difficulty, this method permits the teachers to assess the students. The evaluation of the students' solutions is done by the teachers participating in the capitalization project. This model allows the students to build efficient connections when they collaborate with other students from different universities of other countries. The aim of future works is to develop the MOOBC supporting this model and evaluating all its modules.

References

[1] Pappano, L. (2012). The Year of the MOOC. The New York Times, 2(12), 2012.
[2] Downes, S. (2012). Connectivism and Connective Knowledge: essays on meaning and learning networks. Stephen Downes Web.
[3] Siemens, G. (2014). Connectivism: A learning theory for the digital age.
[4] Lane, L. Three kinds of MOOC, Lisa's (online) teaching blog (blog post). Retrieved December 15, 2015 from http: //lisahistory.net/wordpress/2012/08/three-kinds-of-moocs/.
[5] Clark, D. MOOC: taxonomy of eight types of MOOC (blog post), Donald Clark Plan B (blog post). Retrieved December 15, 2015 from http://donaldclarkplanb.blogspot.co.uk/search?q=MOOCs:+taxonomy.
[6] Gilliot, J.-M., Garlatti, S., Rebai, I., & Belen-Sapia, M. (2013). Le concept de iMOOC pour une ouverture maîtrisée ». Retrieved January 05, 2015 from http://ateliermooceiah2013.wordpress.com/.
[7] Rosselle, M, Caron, P-A. Heutte.J .Prémisse d'une typologie et des principales dimensions d'un cadre de description pour les MOOC (JOCAIR Conference 2014). Retrieved January 08, 2015 from hhtp://www.academia.edu/9674932/A New Framework for Massive Online Open MOOCs.
[8] Schoenack ,l. A New Framework for Massive Open Online Courses (MOOCs). Journal of Adult Education, Volume 42, Number 2, 2013.
[9] Ramesh, A., Goldwasser, D., Huang, B., Daumé III, H., & Getoor, L. (2013, December). Modeling learner engagement in MOOCs using probabilistic soft logic. In NIPS Workshop on Data Driven Education (Vol. 21, p. 62).
[10] Nyoni, J. (2013). The viral nature of massive open online courses (MOOCs) in open and distance learning: discourses of quality, mediation and control.Mediterranean Journal of Social Sciences, 4(3), 665.
[11] García-Peñalvo, F. J., Hermo, V. F., Blanco, Á. F., & Sein-Echaluce, M. (2014, October). Applied educational innovation MOOC: learners' experience and valorization of strengths and weaknesses. In Proceedings of the Second International Conference on Technological Ecosystems for Enhancing Multiculturality (pp. 139-145). ACM.
[12] Iqbal, S., Zang, X., Zhu, Y., Chen, Y. Y., & Zhao, J. (2014, December). On the impact of moocs on engineering education. In MOOC, Innovation and Technology in Education (MITE), 2014 IEEE International Conference on (pp. 101-104). IEEE.
[13] Liyanagunawardena, T., Williams, S., & Adams, A. (2013). The impact and reach of MOOCs: a developing countries' perspective. eLearning Papers, (33).
[14] Grundstein, M., « La capitalisation des connaissances de l'entreprise, système de capitalisation des connaissances », L'entreprise apprenante pp 58, actes de congrès, Aix en Provence, 1995.