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A typology and dimensions of a description framework for MOOCs

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Abstract: the single acronym of MOOC (Massive Online Open Course) refers to many different realities. We mainly infer about the MOOC object from what we can see or read about it. However, these inferences (inductions from partial vision) lead to contradictory assertions. Nevertheless, we need to accurately describe a MOOC. In this context, this research work proposes to build a description framework for MOOCs with the aim of complementing a typology of MOOCs. We have first presented different attempts to classify MOOCs. Next, we show how they are still confusing. Then, we apply some typologies, which were efficient for Technology Enhanced Learning (TEL). For the description framework, we have gathered properties that describe MOOCs. Then, in an abduction approach, we have structured them in eight dimensions. We have also proposed an initial typology that uses simple and concrete name for types.
Keywords: MOOC, description framework, typology, TEL (technology enhanced learning).

1 Introduction

MOOCs (Massive Online Open Courses) refer to many different realities; they involve different teaching methods, and different interaction modes, etc. (Daniel, 2012; Gilliot, Garlatti, Rebai, & Belen-Sapia, 2013; Lane, 2012; Plourde, 2013; Schneider, 2013). It is confusing to designate them by this unique acronym (Hill, 2012). Why is it so difficult to conceptualize the MOOC object? We mainly conceptualize it by inducing from what we can see or read about it. These inductions (from a partial view) often result in contradictory assertions, depending on their authors. Nevertheless, we need to accurately describe MOOCs. We aim to help MOOC researchers, and designers to agree on a shared vocabulary. In this context, the research work presented here initiates a process to build a description framework and a typology for MOOCs.

Having a description framework is interesting for research into Technology Enhanced Learning (TEL) for five reasons. Firstly, we can better compare a (past, ongoing, or future) MOOC to another one. Secondly, we can also better compare them to other devices designed for distance or blended learning (e.g. LMS—Learning Management System—, CSCL—Computer Supported Collaborative Learning). Thirdly, we can estimate whether we can transpose results of previous TEL research. Fourthly, it could enable us to capitalize on-MOOC research results themselves. For example, can we transfer the results obtained on one MOOC to those of another MOOC if we exactly know what they have in common or in what they are different? Finally, this framework could help to make our administrative staff or colleagues formulate their demands more precisely when they ask us to build a MOOC, for research or teaching purposes.

We need to take a step backward, in order to model a MOOC as an object of study. Thus, how can we propose a description framework, which allows us to quickly and easily identify a MOOC? We have anticipated three difficulties. Firstly, we must develop a framework that will combine the points of view of different academic disciplines and fields. Those disciplines are learning sciences (teaching, learning, and education sciences), cognitive sciences, computer science, information technology, psychology, sociology, communication and information sciences, etc. Moreover, several academic disciplines have already addressed together some fields, such as social networks, learner communities. Secondly, all these points of view result in many criteria and many aspects. Nevertheless, how can we balance between comprehensiveness and relevance in the description framework? Thirdly, not all those who will use the description framework are researchers (some are politicians, some are teachers, some are staff members, etc.). We should consider that.

We aim to initiate the building of a typology and of a description framework. We conduct these two sub goals in parallel because they intertwine. Moreover, we do not want to build them from scratch. Hence, we have tried to find an existing typology and an existing framework, which match our goal. Our approach also consists in applying some existing typologies, which were not defined for MOOCs but were efficient for TEL. By doing this, we have gathered properties, which should describe a MOOC well enough, and should be included in our description framework.

We will first present a state of the art version, which contains three parts: some attempts to distinguish MOOCs, some existing typologies, and an existing description framework designed for MOOCs. Then we will introduce our two propositions: a typology and a description framework for MOOCs. Finally, we will discuss our propositions.

2 State of the art: attempts to define typologies and frameworks for MOOCs

2.1 Four typologies of MOOCs

In this section, we present, apply, and discuss four typologies.

2.1.1 Presentation of the typologies

We studied four attempts to distinguish a MOOC from another one. The first attempt has introduced an historical distinction. Then the following one has addressed the teacher's focus within the MOOC, the third one the learning functionalities of MOOCs. The last one has relied on opening or closing dimensions in MOOCs.

Firstly, the MOOC acronym appeared in the context of connectivism (Siemens, 2005; Kop & Hill, 2008). Then, the distinction between cMOOCs (where 'c' stands for connectivist; in the spirit of the first MOOC) and xMOOCs (where 'x' stands for transfer) emerged (Daniel, 2012). In a cMOOC, the course relies more on the connections between learners rather than on the content they learn together. On the contrary, in an xMOOC a predefined content (i.e. knowledge) is the target.

Secondly, Lane meets the objective of the previous paragraph by seeking the focus on which the teacher has designed the MOOC (Lane, 2012). She defines three types of MOOCs:

- "Content-based MOOCs (xMOOCs)
- Task-based MOOCs (tMOOCs)
- Network-based MOOCs (cMOOCs)"

The added type "tMOOCs" refers to MOOCs that focuses on the tasks the learners have to perform; the community and the contents are only a support. In content-based MOOCs, contents (i.e. knowledge) prevail. While in network-based MOOCs, the community dominates.

Thirdly, Clark has described a typology based on "pedagogy" ("learning functionalities"). (Clark, 2013) defines eight types of MOOCs:

- "TransferMOOCs are xMOOCs,
- MadeMOOCs implement more crafted and challenging assignments,
- SynchMOOCs are synchronous MOOCs with fixed start days, end days, and deadlines for assignments,
- AsynchMOOCs are asynchronous MOOCs with no (or frequent) start days, and tend to have no or looser deadlines for assignments,
- AdaptiveMOOCs are MOOCs that use adaptive algorithms to present personalized learning experiences,
- GroupMOOCs are MOOCs starting with small and collaborative groups of learners,
- ConnectivistMOOCs are cMOOCs, and
- MiniMOOCs are shorter MOOCs for contents and skills that do not require a semester structure".

Fourthly, in (Gilliot, Garlatti, Rebai, & Belen-Sapia, 2013), the authors asked themselves what dimensions are opened or closed in a MOOC, from the learners' point of view. They explored five dimensions (see first column of Table 1). Thereby, in a cMOOC, "all dimensions are opened" while in an xMOOC "almost all dimensions are closed except of the group organization", which is sometimes free, and sometimes imposed by the teacher.

These authors introduced another type of MOOCs: the iMOOC. It has more opened dimensions than an xMOOC and less than a cMOOC. By opening the choice of resources, the organization of the group work and possibly the collaborative production, its main goal is to allow an investigative approach (hence the 'i').

Table 1: Some opened or closed dimensions, translated from Gilliot and colleagues.

	cMOOC	**iMOOC**	**xMOOC**
Learning goals	O	C	C
Choice of resources	O	O	C
Organization of the learning activities	O	C	C
Organization of the group work	O	O	C/O
Collaborative co-production	O	C/O	C

2.1.2 Application to examples of MOOCs

For studying the previous attempts, we applied each of them to four examples of MOOCs, which occurs during 2012-2013:

- "Gamification"(1) (referred as "1-G" in Table 2) was a course taught in end summer 2012 by Kevin Werbach of University of Pennsylvania,
- "Writing in the Science"(2) (2-W) was a course taught in Fall 2012 by Dr. Kristin Sainani of Stanford University to learn how to write correct scientific publications,
- "Project Management"(3) (3-P) was a course taught in French in Spring 2013 by Rémi Bachelet of "École Centrale de Lille", and
- "Digital identity"(4) (4-D) was a French MOOC, which ran in early Summer 2013, to teach how to understand and manage one's digital identity.

Other sessions of the first three MOOCs have occurred since.

The four MOOC examples are xMOOCs according the typologies described in the first paragraph, in the Lane's typology ("content-based MOOCs"), and in the Clark's typology ("transferMOOCs"). Yet, these examples of MOOCs differ a lot. However, thing are more complex with the fourth typology. Because these examples are xMOOCs, each column of Table 2 should match the xMOOC column of Table 1.

Table 2: Are the four examples some xMOOCs according to Gilliot and colleagues?

	1-G	2-W	3-P	4-D
Learning goals	C	C	C	C
Choice of resources	C	C/O	C/O	C/O
Organization of the learning activities	C	C	C/O	C
Organization of the group work	C (NA)	C (NA)	O	C/O
Collaborative co-production	C (NA)	C (NA)	O	C/O

In Table 2, we highlight (italic and bold) the differences with the corresponding column of Table 1. "NA" means "not applicable". For example, for the gamification MOOC (column 1-G), the teacher decided not to integrate work group in his course. From the learner's point of view, the organization of the group work is closed. Moreover, we put "C/O" when it is closed or opened, depending on what we consider. For example, if the resources are the teaching materials, the choice of resources is closed for our four examples. If the resources are contents on what the learner has to apply his new knowledge on the assessments, then it is opened. Thus, the "choice of resources" dimension definition is too large.

With these considerations, only the first two MOOCs match with the dedicated column of Table 1 and thus are xMOOC in the fourth typology. Moreover, if we focus on the sequence "C, O, C, O, C/O", the two last columns of Table 2 also match the iMOOC column of Table 1.

In brief,

- "Gamification" is an xMOOC, a synchMOOC, and a miniMOOC (6 weeks),
- "Writing in the sciences" is an xMOOC (and a transfer-MOOC, and a content-based MOOC), a synchMOOC, a madeMOOC, and a miniMOOC (8 weeks),
- "Project management" is an xMOOC (and a transfer-MOOC, a content-based MOOC), a tMOOC, a madeMOOC, a synchMOOC, a groupMOOC, a miniMOOC (5 weeks), and an iMOOC, and
- "Digital identity" is an xMOOC (and a transfer-MOOC, a content-based MOOC), a synchMOOC, a groupMOOC, a miniMOOC (8 weeks), and an iMOOC.

2.1.3 Discussion

The distinction cMOOCs/xMOOCs of the first typology is the best known. Many authors have often referred to this distinction. Even though, it can work at a first glance, too many differences remain between two MOOCs of the same type.

One advantage of the Lane's typology is: the added words before the acronym are more meaningful than letters. However, as for the previous paragraph, too many differences persist inside one type.

In his typology, Clark mixes diverse points of view:

- Knowledge acquisition mode (via transfer vs. via social connections)
- Assignment types (simple vs. crafted)
- Mode of delivery (synchronous vs. asynchronous)
- Social dimension (small collaborative groups)
- Duration (shorter than a semester vs. a semester long)
- Adaptation (adaptive or not)

All of these features could be components of a type of pedagogy (educational contexts). Moreover, his eight types do not match eight different "pedagogies". In fact, a MOOC can belong to several Clark's types. Moreover, if we consider only two values for the six points of view, we count sixty-four types of MOOCs (two to the power of six).

For the fourth typology, as in the previous paragraph, with only five dimensions listed in Table 1, we have thirty-two types of MOOCs. Moreover, other authors consider more than five dimensions, e.g. fourteen in (Jézégou, 2010) thus about four thousands types. Even though we think it is interesting to know what dimension is opened (or not) to describe a MOOC (in a description framework for MOOCs), we do not think we can base a typology of MOOCs on openness. It rather is a property of some features in a MOOC.

2.2 Existing typologies, which were defined for TEL

We present and discuss three typologies.

2.2.1 Presentation of the typologies

The De Vries' typology. De Vries described the spectrum of learning software available in 2001 (de Vries, 2001). Table 3 lists eight education functions, the type of software, and the education theory she associated to these functions.

Table 3: The eight educational function and some Features – translated from (de Vries, 2001).

Education function	Type of Software	Educational Theory
Present information	Tutorial	Cognitivist
Provide exercises	Repeated exercises	Behaviorist
Truly teach	Intelligent Tutoring System (ITS)	Cognitivist
Captivate the attention and motivation of the learner	Educational (serious) game	Mainly behaviorist
Providing an exploration space	Hypermedia	Cognitivist, Constructivist
Providing an environment for natural laws discovery	Simulation	Constructivist, situated cognition
Provide an environment for exploring abstract domains	Micro-world	Constructivist
Provide a space for exchange among learners	Computer Supported Collaborative Learning (CSCL)	Situated cognition

The Typology of Gauthier and Colin. Four years latter, authors of (Gauthier and Colin, 2005) have the same goal than De Vries. They defined cartographies in order to help teachers to find an ICT (Information and Communication Tools). Each cartography allows accessing the ICTs from different points of view. Thereby, the authors identify educational paradigms ICTs implement, and educational situations they allow. Their eight educational paradigms underlie various activities and teaching practices, which are combinable:

- Problem solving
- Improvement and progress
- Project, practice
- Training, assessment

- Facilitating, support
- Tutoring, coaching
- Presentation, demonstration
- Discovery, research

The nine educational situations are the areas situated at the intersection of a two-dimensional array. These dimensions are the social dimension (three values: individual, groups and communities) and the time dimension (three values: sequence, module, courses). It defines nine areas. An ICT may occupy several areas.

Hy-Sup. Hy-Sup (Deschryver & Charlier, 2012) was a European research project. It produced configurations for describing blended learning systems (French: "Systèmes Hy-brides") used in higher education (Fr: "Éducation Sup-érieure"). Hy-Sup has defined six configurations:

- Scene corresponds to a content-oriented teaching, support to face-to-face education, with mainly textual resources,
- Screen is scene with added multimedia resources,
- Cockpit corresponds to a course organization oriented teaching, guided by the use of tools (and sometimes integrating relational and reflective goals),
- Crew aims for learning focused on supporting the process of knowledge construction and on interpersonal interactions,
- Public space aims learning centered on the opening of the training device to external resources, and
- Ecosystem aims for learning by operating a large number of technological and educational opportunities.

2.2.2 Discussion: are the previous typologies useful to define types of MOOCs?

The De Vries', and Gauthier & Colin's typologies lacks the social dimension of MOOCs. It makes sense because this dimension was almost nonexistent in the ICTs of this period. The six Hy-sup configurations seem very interesting to keep. Indeed, we can match some categories of MOOCs of this section to Hy-Sup configurations, and do the four following conjectures:

- xMOOCs, transferMOOCs, and content-based MOOCs could at least be screens,
- tMOOCs, and madeMOOCs could be from cockpits to crews,
- cMOOCs, iMOOCs, groupMOOCs, and network-based MOOCs could be from public spaces to ecosystems, and
- adaptiveMOOCs, miniMOOCs, synchMOOCs, or asynchMOOCs could be one of the previous three items.

However, MOOCs are not blended-learning devices. Therefore, it is important to take into account the description dimensions on which the Hy-Sup configurations rely, even though we should adapt them.

2.3 Existing description framework for MOOCs

Just a few days latter as we presented our research in the LASI meeting (Learning Analytics Summer Institute) in Lyon (France) at the beginning of July 2013, Schneider displayed her framework in an AIED workshop in Memphis (USA). Our approaches are similar. In (Schneider, 2013), the author described a framework that brings together some metadata about MOOCs. It has two levels. The first level, called "general", gathers general information about the MOOC (e.g. name, author, certificate). The second level, called "ILE and Stances" (Interactive Learning Environment), has four frames: instruction (how the knowledge is taught), content (how the knowledge is structured, e.g. in modules), assessment, and community.

These groupings and the properties are very interesting. Nevertheless, the Schneider's framework lacks of some dimensions we need. We have reused a part of it, and we have enriched it. The levels and properties of Schneider we have reused will appear in the proposition section.

3 Propositions: a typology and a description framework for MOOCs

Our aim is twofold. We need to precisely describe a MOOC and we need to easily assign a type to it. We conduct these two sub goals in parallel. Indeed, we think the description framework could help to build a typology of MOOCs, and the typology could help to describe a MOOC.

If we want to take into account the main dimensions or features, we have seen in the previous section, the combination of these features lead to too many types. Therefore the resulting typology would be difficult to use, and would be as unclear as the previously cited ones. Our approach is on the one hand to propose a simple

and concrete typology and on the other hand a description framework that specifies some differences between MOOCs of a same type and to describe their main features.

3.1 Whose point of view to consider in our framework?

A MOOC involves many people:

- Course designer teaching team (the teaching team that designed the course), referred later as "teacher"
- Course leading teaching team (the teaching team that actually lead the course)
- Learners
- Tutors, graded learners or accredited learners
- University staff
- Researchers
- Political staff
- Parents of learners

Attempting to conciliate all points of view is unrealistic because they may be incompatible. In our framework, we favor the researchers' point of view. Researchers could focus on four axes:

1. MOOC as a technical and pedagogical platform
2. Use and usability of these platforms and of their courses for learners and teachers
3. Learners' profiles (their knowledge misconceptions or conceptions, or the level or quality of learners' learning)
4. Teachers' point of view or profiles

Teachers' point of view has import because they do take decisions in MOOC design. Hence, researchers could for example focus on the following questions about teachers:

- What types of pedagogical or technical function do they want to offer to learners (e.g. communication functions, organization functions…)?
- What types of activity do they want to organize (e.g. projects, presentation…)?
- What types of pedagogical theory/framework (e.g. constructivism, connectivism…) do they choose in their courses or part of courses?
- What social dimension (individual, group, groups, communities) do they want to privilege in their courses or part of courses?
- What feedbacks do they would like to have for themselves or to give to learners (e.g. about learners' interactions, learners' results, learners that may drop out…)?

For our propositions, we choose to ignore the first axe and to ignore the MOOC platform on which the MOOC courses run, even though we know it influences some choices because we consider what is possible to do with a MOOC without considering how it is done technically.

Even though our propositions are mainly for researchers, we strive to make then as simple as possible, hoping other people would be able to take ownership of them.

3.2 What to remember from the state of the art?

3.2.1 For the proposition of a typology

We have seen we cannot use the types, defined with added letters (c, i, t, and x) or words (asynch, content-based, group, made, mini, synch, task, or transfer) before the MOOC acronym. Moreover, the potential number of types is too big for the typologies of Lane (op. cit.), of Gilliot and colleagues (op. cit.), and of Clark (op. cit.) because of the possible combinations. Furthermore, by applying the typologies to four MOOC examples, we found the types intertwine too much and are non-exclusive. Therefore, these typologies result in too many misunderstands, because too many differences remain between MOOCs that are currently of the same type. They are still confusing, and include many implicit details. Otherwise, the Hy-sup configurations (op. cit.) can help to define a first typology for MOOCs.

3.2.2 For the proposition of a description framework

We gather features to describe MOOCs. We partially or totally reuse:

- The connectionist educational paradigm of Siemens (op. cit.)

- The dimensions from Gilliot and colleagues (op. cit.) of Table 1
- The focus on which the teacher has designed the MOOC (of Lane's Typology, op. cit.)
- The Clark's points of view (op. cit.)
- The educational functions, educational theories, and types of software of de Vries (op. cit.)
- The educational situations and paradigms of Gauthier and Colin (op. cit.)
- The Hy-sup dimensions Deschryver and Charlier (op. cit.) have used to define the Hy-Sup configurations
- The levels and items of Schneider (op. cit.)

3.3 Proposition 1: using Hy-sup configurations as corner stones for a first typology

We aim to propose a first typology that should describe as few types of MOOCs as possible. Each type should have an easily understandable, easy to remember, and concrete name. We do not want to build it from scratch. Therefore, we propose to use the six Hy-Sup configurations (op. cit.) as corner stones of a first typology, i.e. a typology on which researchers could base the continuing building of a more fitted typology.

We have made this choice for three reasons:

- Hy-sup configurations are tangible,
- Hy-sup has few configurations, and
- The state of the art shows us they are compatible with the typing of MOOCs.

Hence, our HySup-based MOOC typology has six types:

1. Scene MOOC
2. Screen MOOC
3. Cockpit MOOC
4. Crew MOOC
5. Public space MOOC
6. Ecosystem MOOC

We have wondered whether to make educational theories (or paradigms) appear in our typology. In fact, we have decided to ignore them here, because to implement a theory, teachers can choose any of the previous types. For example, in a connectivist course, they can choose a Scene MOOC just for managing their teaching without providing any videos. We have also made the same reasoning for the software functionalities a MOOC can Implement.

3.4 Proposition 2: a description framework for MOOCs

We first discuss the temporal scope of the description framework. Then we explain its general structure, and partly detail it.

3.4.1 Temporal considerations

If the description framework of a MOOC is filled, before the MOOC starts, then it can contain information that has been chosen and anticipated by the teacher. If the description framework of a MOOC is filled after the MOOC has closed, then it can also contain additional data like, total number of inscriptions, traces, etc., and can even incorporate data that are calculated from traces or other data.

Defining a framework in the first case is easier than in the second case. We should start by doing the first one, even if we have anticipated some needs for the second one. Therefore, we propose an extendable framework.

3.4.2 General presentation of the framework

In order to make the description framework easy to understand, we should choose as few dimensions as possible; a dimension is a grouping of properties. In this article, we focus on the main dimensions chosen for the description framework. We detail two of them. Further research will publish others. For these dimension, we explain below how we build them.

Because, the number of properties to take into account is huge, we have to find the best rules for grouping those properties. This kind of approach is abductive.

The hugest group of properties concerns instruction. Therefore, we have decided to split the instructional properties in five distinct dimensions:

- One for the places and roles of humans in the MOOC ("human")
- One for the educational (teaching and learning) material ("resources")
- One for the assessments and feedbacks

- One for the specific technical and educational functionalities the teacher prescribes in the course ("functionalities")
- One for the other instructional properties ("instructional")

Hence, we propose to describe a MOOC with the following dimensions:

- General*
- Context
- Instructional*
- Resources
- Assessments* and feedbacks
- Human
- Functionalities
- Other stuff for researchers

In this list, the asterisk symbol indicates dimensions, for which we have the same name than the Schneider's one (Schneider, 2013). However, the content of ours is most often a bit different from hers.

In this framework, some properties can stay empty. We define a minimal group of properties, sufficient to describe a MOOC to learners and most people. A second group collects general information about the instructional properties (choices). Then teachers can precise other instructional properties if they want it. Moreover, researcher can fill the properties, relevant to their domain.

Each dimension refines in sub dimensions, like branches of a tree. Eventually, a sheet corresponds to a property, which may be valued.

3.4.3 Details of the "General" dimension

The "General" dimension gives general and public information about the course (see Figure 1). It maps the minimal group of properties. This dimension gathers information that usually appears in MOOC adverts. To fill this dimension, we studied Coursera, Udacity, and Canvas course adverts and those of our four examples of MOOCs. We also add our type in this dimension.

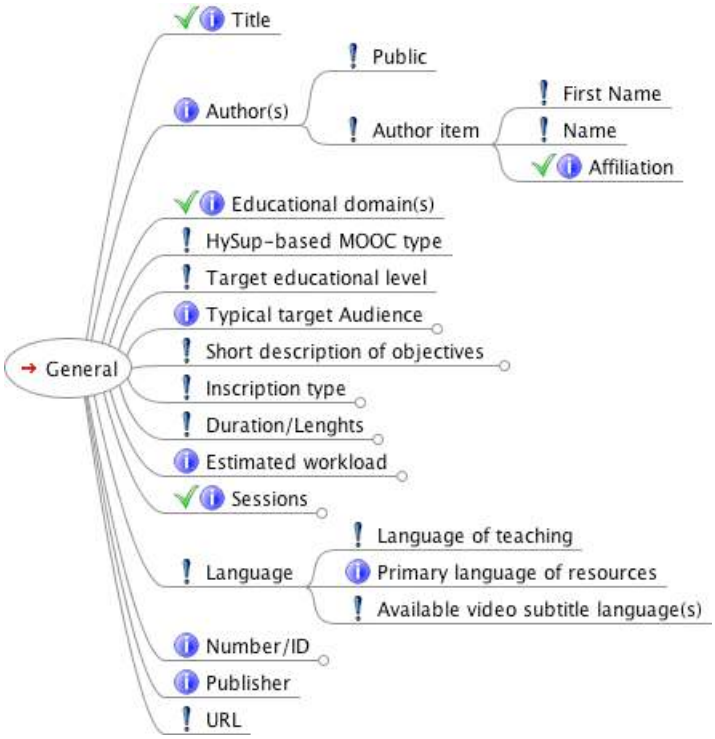

Figure 1. The General dimension.

In Figure 1, properties with a white 'i' in a blue circle symbol are properties, common with the "general level" of Schneider (op. cit.). The ones with an added green check symbol are renamed properties. We add the ones with an exclamation point symbol. We have included neither the "content for wrapped in-person course (location and dates offered)" nor the "pace (cohort-based vs. self-paced)" from Schneider (op. cit.), because they have taken place in other dimensions of our framework. Table 4 details some properties.

Table 4. Detail of some properties.

Property			Description	Type	Constraint
Title			Name or title of the course		
Author(s)			Author or authors of the courses		One item per author.
	Public		Do(es) the author(s) appears in the MOOC advert	Yes/No	
	Author item				
		First name	First name		
		Name	Name (surname)		
		Affiliation	University, institution, or faculty membership		
Educational domain(s)			Teaching domain or domains	Use existing standard	One item per domain
HySup-based MOOC type			The type of the MOOC as defined above		
Typical target audience			The typical learner for which the teacher has designed this course		
	Status		The typical learner's status in real life	Student, professional, …	
	Entry level			None, pre-collegiate, undergraduate, graduate, expert, or typical age range	
…					
URL			Localization on the Internet		

3.4.4 The "Context" dimension

The "Context" dimension stores information that should help to understand the context of use for which the teacher designed the course. Many researches inspire us to fill this dimension. From now, we use the spatio-temporal components of Jézégou (op. cit.) and the "pace" from Schneider (op. cit.) ("pace" appears both in her "general level" and in the "content" frame of her second level).

3.4.5 The "Instructional" dimension

The instructional dimension collects information about the instructional decisions and choices except those previously explained.

To build this dimension, we have used educational paradigms cited in De Vries (op. cit.) and Siemens (op. cit.), the learner's tasks and the educational activities of De Vries (op. cit.), the focus of the learner activity of Lane (op. cit.). We have added choices about knowledge acquisition mode and mode of delivery of Clark (op. cit.). We have extended the dimensions of Gilliot and colleagues (op. cit.) because we include other properties than openness. We have also added the "instructor involvement", "lecture", and "reading" from the "instruction frame" of the Schneider's second level.

3.4.6 The "Resource" dimension

The "resource" dimension describes the learning material in general. It brings together resources as video, text, etc., and non-palpable resources, which people can bring (e.g. knowledge, skills). For this dimension, we use numerous researches about resource description and indexation.

3.4.7 The "Assessment" dimension

The assessment dimension (see Figure 2) describes the existence of an assessment process or not, and if any, what it consists in. In this dimension, we have used the choices of assignment types of Clark (op. cit.).

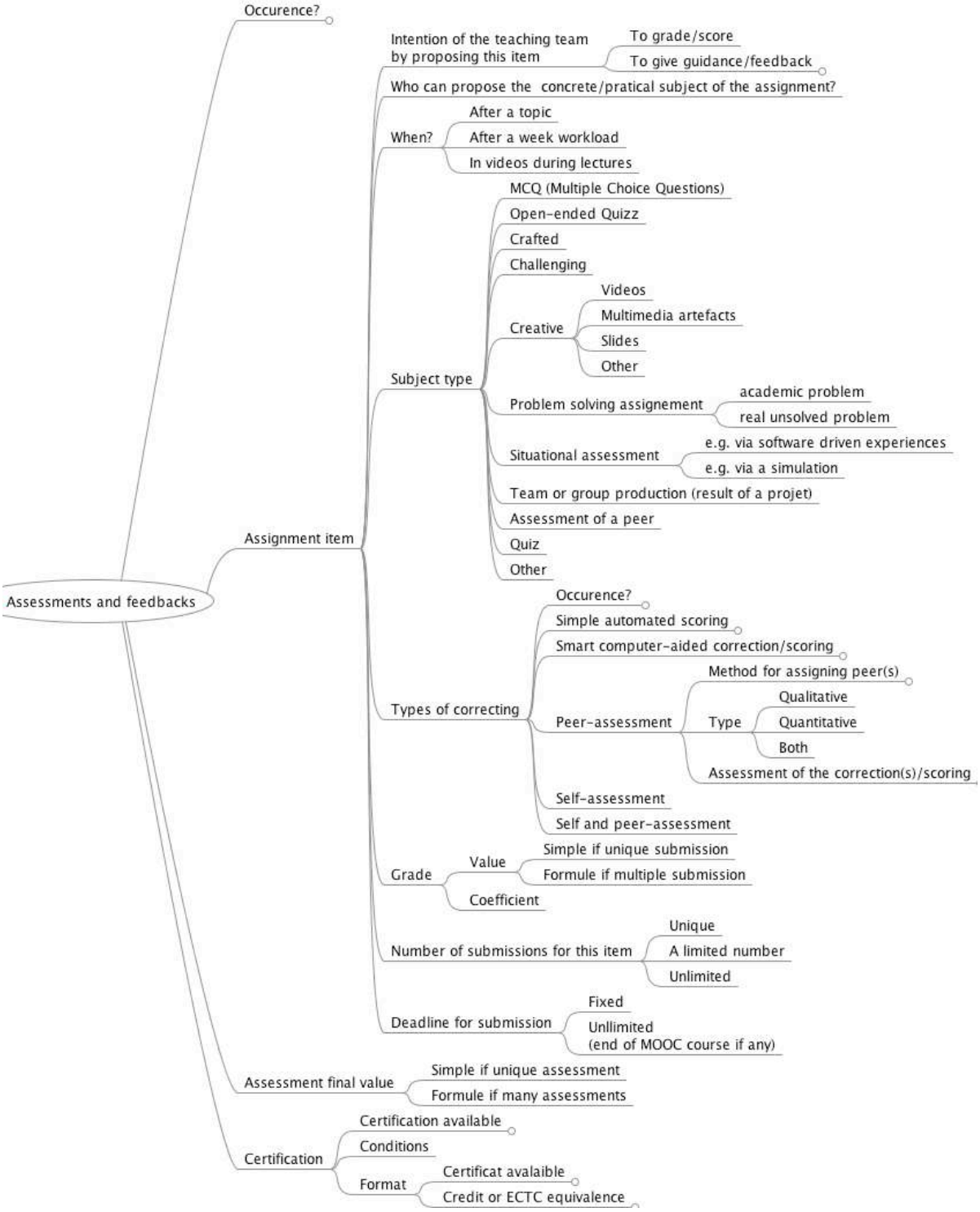

Figure 2. Assessment tree.

3.4.8 The "Human" dimension

This dimension describes personal dimension of the learner: role, status, etc. It also depicts its social interactions (teacher's prescription): does the learner work in a dyad, a small group, a learner social network inside the MOOC, and an extended network outside the MOOC? Furthermore, it qualifies the scope and the type of these interactions.

3.4.9 The "Functionalities" dimension

Technical and educational functionalities are choices the teacher prescribes to learners. For example, a MOOC can involve an Intelligent Tutoring Systems (ITS) in a specific educational activity. These functionalities can either be built in the MOOC platform or used outside of the platform (e.g. be in the learner's PLE – Personal Learning Environment). To fill this dimension we reuse the types of software and the educational functionalities of De Vries (op. cit.) and the category of tools of Gauthier & Colin (op. cit.).

3.4.10 The "Other stuff for researchers" dimension

We have put here many things researchers may need like teacher models, learner models, trace model, interaction model, traces, calculi (e.g. interest, flow, intrinsic and extrinsic motivation, engagement, feeling of self-efficacy, relatedness), etc. We suggest structuring the traces and calculi with the same dimensions than the ones made for the prescriptions, especially context, instructional, human, and resources. The principle is to consider each property of other dimensions as reference property, and the property of this dimension as actual property. For example, "actual pace" refers to information about the real pace observed during the course.

4 Discussion of our propositions

4.1 Discussion of proposition 1: HySup based typology

In this section, we check if HySup based typology can match different pedagogical paradigms, and different importance given to the community role. The first three types are teaching-oriented, while the last three ones are learning oriented. Therefore, we think it translates different educational paradigms, where the main role is played either by the teacher or the learner. Moreover, a discontinuous grading exists between the first type and the last one: in the first one, the learner interact less with the MOOC, the MOOC offers fewer tools to the learners and fewer liberties, and learners interacts less with one another than in the sixth type. Thus, it can fit to different importance given to the community.

Now, we apply the Hy-Sup configurations to our four examples of MOOCs.

"Gamification" is a screen, because it uses video. It is not of other types, because:

- it is not guided by the use of tools,
- it supports neither the process of knowledge construction nor the interpersonal interactions,
- the learning is not centered on the opening of the training device to external resources, and
- it does not aim at learning by operating a large number of technological and educational opportunities (only a large number of resources).

"Writing in the sciences" is crew, because individuals have to interact to enhance each other productions. It is neither a public space nor an ecosystem because the MOOC device is closed.

"Project management" and "Digital identity" are public spaces, because these MOOCs are opened to external resources and technical opportunities.

4.2 Discussion of proposition 2

Table 5 illustrates how we are assessing our description framework by applying it to our four examples.

Table 5: Application of the general dimension to the Gamification MOOC.

Property (and its sub-divisions)			**Application example**
Title			Gamification
Author(s)			
	Public		True
	Author Item		
		First Name	Kevin
		Name	Werbach
		Affiliation	University of Pennsylvania
Educational domain			
	Domain item		Information
	Domain item		Technology
	Domain item		Design
	Domain item		Business
	Domain item		Management

Property (and its sub-divisions)	Application example
HySup-based MOOC type	Screen
…	

This application is only a first step. Indeed, to be valid, we will apply our framework to other MOOCs. Moreover, to be acceptable by other researchers, they should be able to fill it with as little help as possible.

5 Conclusion

In this article, we intend to classify MOOCs in as few types as possible, and to define a description framework for MOOCs. We started by studying some attempts to classify MOOCs. Then we applied each of these attempts to four examples of MOOCs, which occurs during 2012-2013. Finally, we studied existing typologies and a framework. This study teaches us these typologies confuse people. It also allows us collecting many properties, which can characterize a MOOC.

On the one hand, we propose a typology based on the six Hy-Sup configurations: scene, screen, cockpit, crew, public space, and ecosystem. On the other hand, we structure the properties of a MOOC in eight dimensions: general, context, instructional, resources, assessments & feedbacks, human, functionalities, and other stuff for researchers. This work is a first step that should be refined, based on feedbacks and contributions of researchers and people from diverse horizons.

To do that, our future trend consists in publishing the framework on a platform by using semantic web tools in order to allow other interested people to navigate in it and to use a search engine on the collection of published MOOC descriptions. In our framework, we will encode properties as metadata. Moreover, both properties and values will use commonly accepted standards everywhere it is possible.

We also should compare our framework to the one that Siemens (Siemens 2013) has announced between the acceptation of our article and its publication.

Finally, with a more stabilized description framework, a pattern (or a set of patterns) in it could correspond to a new type in our initial typology of MOOCs. To identify the patterns, we would place some dimensions of the description framework on the axes of a hypercube; a pattern would be a hyper sphere of the universe defined by the hypercube.

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(2) Sainani K., Writing in the Sciences, Stanford, https://www.coursera.org/course/sciwrite/.

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(4) iNUM MOOC, on digital identity, http://MOOCwebvm.univ-valenciennes.fr/