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MOOCs as contemporary forms of books: new educational services between control and conversation

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Abstract

This text is devoted to an analysis of the Moocs, taking the viewpoint of the participants in these distance courses. Drawing on the emergence of new practices of training consumption, it tries to make the link between different perspectives of research: those coming from distance education, those relating to the analysis of educational resources, from textbooks. Taking into account the evolutions of books, especially with digital and Internet, it shows that considering Moocs as contemporary forms of educational (or cultural) books leads to change certain research issues and, more simply, the analyses devoted to them. Finally, it discusses two central processes in education, conversation and control, and shows how their articulation is reflected in the Moocs and how they are designed and used.

Key words: Mooc, Book, Control, Conversation, Scrambled book, Monitorial system.

Résumé

Ce texte est consacré à une analyse des Mooc, prenant le point de vue des participants à ces cours à distance. S'appuyant sur l'émergence de pratiques nouvelles de consommation de la formation, Il essaye de faire le lien entre différentes perspectives

de recherche: celles venant de l'enseignement à distance, celles portant sur l'analyse des ressources éducatives, à partir des manuels scolaires. Prenant en compte les évolutions du livre, notamment avec le numérique et Internet, Il montre que considérer les Mooc comme des formes contemporaines de livres éducatifs (ou culturels) conduit à changer les problématiques de recherche et plus simplement les analyses qui leur sont consacrées. En effet, il discute deux processus centraux en éducation, la conversation et le contrôle et montre comment leur articulation se retrouve dans les Mooc, leur conception et leurs utilisations.

Mots clés: Mooc, Livre, Contrôle, Conversation, Livre brouillé, Enseignement mutual.

Resumo

Este texto volta-se a uma análise dos Moocs, considerando o ponto de vista dos participantes em cursos a distância. Com base no surgimento de novas práticas de formação, busca-se estabelecer o vínculo entre diferentes perspectivas de pesquisa: as que procedem da educação a distância e as relacionadas à análise de recursos educacionais, a partir de livros didáticos. Tendo em conta a evolução dos livros, especialmente com o suporte digital e a internet, mostra-se que considerar Moocs como formas contemporâneas de livros educacionais (ou culturais) leva a mudar certos problemas de pesquisa, bem como as análises a eles relacionadas. Finalmente, discutem-se dois processos centrais na educação, a conversa e o controle, mostrando como sua articulação se reflete nos Moocs, na forma como eles são projetados e usados.

Palavras-chave: Mooc, Livro, Controle, Conversa, *Scrambled book*, Monitoria.

Is the textbook necessarily a book, and a printed book, or can it take other forms and consequently imply other uses?

(Choppin, 2008)

Introduction

2012 marked the global launch of the Mooc. In an article entitled *The Year of the MOOC*¹, the *New York Times* covered this American phenomenon and announced impressive numbers of registrations (Cisel & Bruillard, 2012). For example, Sebastian Thrun's course named *Introduction to Artificial Intelligence*, with Udacity, announced more than 160,000 students. But the phenomenon soon became very ambivalent, in the manner of the Internet economy, promising to democratize knowledge while leaving

1 http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0

serious doubts about its commodification (merchandisation). Therefore, given the potential risks of global domination by some major US universities, European platforms were launched (FUN², Iversity³, MiriadaX⁴, FutureLearn⁵). A research literature quickly developed in order to improve the educational offer of Moocs and to explore what could be done with the multiple data that could be extracted from the interactions of so many students using Mooc platforms.

Five years later, if the superlatives used to describe Moocs have disappeared, the offer has become more widespread. Moocs are oriented not only towards university students but also towards life-long learning, especially within companies, towards schoolchildren and the general audience.

But the Mooc phenomenon is also changing, with an association with small, private courses (SPOCs), the use of adaptive teaching, and so on. New forms of distance learning and new educational practices have emerged and are spreading, with some adjustments. Thus, one can now consider it interesting to revisit the Mooc issue and study the impact of certain characteristics of this type of teaching.

It is certainly daring to say that cathedrals can in some respects be seen as precursors of Mooc platforms. Yet, Pastoureau (2014), looking at the tympanum and the portals, shows how the carved decoration has a teaching role, both theological and moral. Sculptures are used rather than text, because of the target population and its skills. In addition, the cathedrals were a place of social activities.

In this text, I will try to show that Moocs may be considered as one of the contemporary forms of books, mainly educational books. For this, I will return to some major evolutions of the book in order to show how they can be incarnated in Moocs.

Then, I will set in tension two antagonistic but complementary positions on the processes of teaching: the control and the conversation. It seems to me that Moocs question educational resources, because they show important directions in educational books and illustrate educational practices that may develop.

What is a Mooc?

A first definition

Most definitions start from the different elements that make up the acronym, Massive Open Online Course. This approach shows the advantages and disadvantages of the Mooc.

2 <https://www.fun-mooc.fr/>

3 <https://iversity.org/>

4 <https://miriadax.net/home>

5 <https://www.futurelearn.com/>

1) It is massive

With a very wide audience (from hundreds to several hundred thousand), it can benefit from many opportunities: statistical advantages (learning analytics and continuous improvement of courses), the richness of the network (if it is diversified) and groups. This enables massively collective activities and new forms of collaboration. It goes to scale and works regardless of the number of registrants.

But this requires interactions that are not dependent on the number enrolled, preferably automated: automated corrections (via quizzes) and peer corrections. Interactions with group cannot be developed much and the adaptation is problematic as well as the differentiation according to the audience. A possible opening is to give more space to participants and their exchanges.

2) It is open

Registration is free for all, without prerequisite or filter.

But this cannot be anytime (except in some particular Moocs⁶) and the sessions are very precise in time, with an imposed rhythm, and an enrolment pattern. Participants must adapt to the dynamics of the Mooc. Also, as there is no cost, students are not really committed.

3) It is online

Moocs benefit from everything that the Internet has to offer.

It is worth noticing that distance education has always taken advantage of new technology, mainly communication technologies and reliable infrastructure.

As soon as a distribution technology is available and reliable (both technical devices and infrastructures), it is used in distance education: postal mail, telephone, radio, television, etc. Formats or modalities that can be broadcast (written, still picture, animated image, etc). Moocs are 'conveyed' via the Internet (of course with modulations according to region and quality of Internet connection), allowing for the transmission of texts, images, sounds, videos, certain forms of interaction (quizzes or more complex) in an asynchronous or even synchronous way. Anything that 'transits' via the Internet, more or less, can intervene in the Mooc.

Beyond distribution technologies, technologies considered legitimate for the writing and preservation of knowledge, traditionally the book and the written word, diversify. Video, initially seen as an illustration, becomes a legitimate element of knowledge.

6 Some Moocs of Openclassrooms (<https://openclassrooms.com/>)

Another evolution relates to what constitutes 'science' in the types of knowledge retained and the forms of writing of the knowledge used, multiple data that can be stored, indexed, and exchanged via the Internet. The context is that of open and participatory science with a gradual erasure of the boundaries between scientist, expert or amateur. Thus, the Mooc 'Common Rocks and Minerals: Genesis, Identification and Uses'⁷ proposes to participants to photograph rocks on site, identify them and exchange them: 'Together, you will put into practice the method of identification of the rocks for you to own.'

4) It is a course

It is not just a set of educational resources accessible on a platform, it is a course.

To summarize, three elements contribute to the characterization of Moocs: distance education (at first, distance courses), social networks (which supplement them without having to control them) and a temporal framework (shorter than university courses).

Various technological and social developments are at the heart of the Mooc phenomenon.

Some lessons learned

The objective of this text is not to provide a complete analysis of the scientific literature concerning Moocs but to highlight the main results (some coming from research in my own research unit, especially the analysis of behaviour of Mooc participants, see Bruillard, 2017).

The collection and analysis of participants' data in many researches, in particular their behaviour, made it possible to modify certain characteristics of the offer, thus shortening the duration of the sessions and the duration of the videos. This has made it possible to identify the current public for Moocs, of whom the vast majority are graduates (at least postgraduate level), or active or looking for work (higher/further education), so consequently few of them (about 15 percent) are students in initial education.

The research also refuted somewhat simplistic media visions, such as the high dropout rate, by studying participants' participation regimes. The perceived low rate of certification is no longer true when we consider those who actually follow or pay to obtain this certification (a rate of 60 percent for the edX Mooc platform). Researchers have highlighted some reliable predictors of effective monitoring of a Mooc to completion, such as participation in forums or registration behaviour (Cisel, 2016). On this point, the methods and algorithms that are used often come from the marketing sector (where the platform owners are more interested in persistence – that is, in continuing a course

7 <https://www.fun-mooc.fr/courses/course-v1:MinesTelecom+04004+session04/about> : « Roches et minéraux courants : genèse, identification et utilisations ». « Ensemble, vous mettrez en pratique la méthode d'identification des roches pour vous l'approprier. ».

– than in learning). Having a very large volume of data does not easily yield convincing results on education. Thus, purely statistical studies are disappointing, everything is 'significant' and what is well documented is not informative (the more we work, the more we have the chance to succeed, see Reich, 2014): big data help to predict behaviour but do not explain learning gains.

The research also sought to categorize the populations of Mooc participants. The extreme heterogeneity of their intentions and of the training previously followed has been well attested from statistical data. Sometimes studies have been able to cross the statistical analyses with more qualitative techniques (interviews or questionnaires) of description of these different populations. Research is being developed that articulates quantitative approaches, with innovative forms of processing and visualization of data (especially time) and very qualitative approaches (interviews, observations, immersion, etc), integrating the notion of learning experience.

To understand Mooc participants, older theoretical frameworks on self-learning and self-direction have proved to be essential. In any case, self-directed skills are required to succeed in low-level Mooc-type training, confirming that simple access to resources, even with the possible support of a social network supported by forums, is far from sufficient. Making learners increasingly responsible for their own learning is a common injunction in contemporary digital society, but the latter will often not be able to assume this responsibility, which questions the democratization goals initially associated with the phenomenon of Moocs.

However, Moocs play an important role in the training of teachers and trainers. In the Mooc surveys of the edX platform (MIT and Harvard), one third of the respondents said they were teachers and 20 percent taught the subject itself (Chang and Dean, 2016). Thus, a non-traditional track with a positive effect of the Mooc was attested, providing resources and learning opportunities to teachers.

Focusing on social practices: reception conditions, connivance and user control

Finally, the social conditions of distance learning – that is to say, social practices and dynamics, modes of participation in training, acceptability, validation and their results (employment, diplomas, etc.) – have evolved considerably. As far as practices are concerned, manuals are no longer used to support online tutorials; rather, video and discussion forums allow users to benefit from solutions found by other users. Thus, in order to acquire new know-how or to provide self-help for everyday objects, access to training is transformed.

Concerning Mooc participants, numerous interviews led by STEF researchers in the years 2013-2015 (Isabelle Quentin, Mehdi Khaneboubi, Matthieu Cisel, Jean Condé)

have produced some salient results (see Bruillard, 2014, Quentin, 2014): the effects of brand (confidence in prestigious institutions offering Moocs), the connivance effects of the Internet video course (feeling of closeness to the speaker), and especially the impact of the social conditions of reception.

Where it used to be necessary to have special equipment to benefit from the contents of the training and to access training (radio, television, cassette players, etc.), now, with computers, tablets, and smartphones, users have unique hardware that is mostly portable and online. There is no need to be in a particular place or to put yourself in special conditions. Picture 1, taken from a blog post by John Warner, explaining why he had failed in following a Mooc, shows this in a very convincing way. As with a book or radio, one can 'follow' the Mooc everywhere, parallel to other activities. One can note the ubiquity of the laptop connected to the Mooc with the face of the teacher: the user is walking along the street, speaking on the phone, drinking coffee, with the piece of paper marked Mooc on the door handle, and so on. It is as if there is a permanent, personal and intimate connection, as with an exciting book that one devours and cannot put down before the end. But the user has control over the training and, even in a course offered by an illustrious professor from a prestigious institution, can interrupt at any time.



Picture 1. Illustration taken from a blog post 'I am failing my Mooc'⁸

Before explaining why we might consider Moocs as contemporary forms of book or textbook, it seems useful to have a quick look at the notion of book, showing how it has evolved and how we can adopt a new vision. As books are the key technology of formal education, we will then try to figure out some changes associated with the development of Moocs in education.

⁸ <http://world.edu/im-failing-my-mooc/>

What is a book?

The book is an everyday object, which is taken for granted. It no longer appears to us to be a technology, whereas it has taken centuries to build. It is clear that the technologies of today, which are constantly within reach, are also in the process of being naturalized. However, the question remains to determine what a book can now be.

A history of the book, in a nutshell

This section will not provide a complete overview of the history of books, but will give some hints about key changes during the past centuries. Some milestones can be found in many references, for example in Wikipedia and an interesting analysis by Chartier (2008) about what a book is. The following examples show the diversity, the link with the evolution of techniques and social practices, as well as some of the comings and goings, and remind that defining what a book can be is difficult. Moocs participate in this evolution of the book, in which one cannot really predict what will happen.

First of all, a book is a technology. The route that led to the invention of the printing press required earlier technologies including the 'manufacturing of paper, development of ink, woodblock printing, and distribution of eye-glasses'⁹, as the movable types attested in China or Korea.¹⁰

What is also noteworthy is that other technologies may be useful or even absolutely essential, not for the manufacture of books, but for access to the printed characters, such as – for some readers – glasses.

We will not describe all the contributions related to the book, in terms of dissemination and access to knowledge and religion, but will simply look at the technological and social evolutions of the book.

Figure 2 shows some examples: the Book of Kells, a page from *Dialogus creaturarum*, the first book printed in Sweden, the very famous Gutenberg Bible and a family Bible of the 19th century. The Bible is somehow a stereotype or reference model.

9 https://en.wikipedia.org/wiki/Printing_press quoting Jones, Colin. *The Cambridge Illustrated History of France* (1st ed.). Cambridge University Press. p. 133. ISBN 0-521-43294-4.

10 https://en.wikipedia.org/wiki/Movable_type



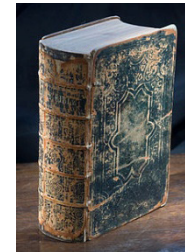
The Book of Kells, folio 292r, incipit to John: 'In principio erat verbum'.¹¹



Page from *Dialogus creaturarum*, the first book printed in Sweden, by Johann Snell in 1483¹²



The Gutenberg Bible¹³



A family Bible (1859)¹⁴

Figure 2. From illuminated manuscript to modern books

Produced in a monastery, the Book of Kells is an illuminated manuscript of the Gospels in Latin, a very precious book that is not for everyone. Johann Snell introduced printing in Denmark and Sweden. Both copies of the Bible give a more typical book image, much like the archetype of the book.

We imagine the book in a form now stabilized with many variants, with a cover, numbered pages, a contrast between the colour of the paper and that of the ink, a summary or table of contents, etc.

Given its many very diverse realizations, we will review briefly some of the elements of the book: technologies that increase its potential, the modes of distribution (soap opera, newspaper, etc) and the recent shift to the notion of service, and we will look more closely at the intriguing example of the game of the hanged man in a book.

An object enriched by technology

Technology has offered a lot of new features: multimedia, multimodal, augmented reality, games, interaction. We have audiobooks, augmented reality books, picture

¹¹ https://en.wikipedia.org/wiki/Book_of_Kells

¹² https://en.wikipedia.org/wiki/Johann_Snell Mikael Lindmark — Facsimile by Michaelisgillet and Bokförlaget Bra Böcker, Domaine public, <https://commons.wikimedia.org/w/index.php?curid=1484307>

¹³ https://en.wikipedia.org/wiki/Bible#/media/File:Gutenberg_Bible,_Lenox_Copy,_New_York_Public_Library,_2009._Pic_01.jpg

¹⁴ <https://upload.wikimedia.org/wikipedia/commons/thumb/7/7f/Family-bible.jpg/220px-Family-bible.jpg> Author: David Ball

books, interactive books, animated books, flip books, folded books, pop-up books, movable books and so on.

A support for activities

You can play with books: enigmas, puzzles, headaches, brain-teasers: 'the book where you're the hero', 'Interactive Fiction: Now You're the Detective'.

Newspapers, serials and books

The 19th century saw a large circulation of daily, weekly, and monthly newspapers and journals, providing stories in episodes, with illustrations and comic strips, with games (with the solution within the newspaper or in the following issue), letters to editors, and surveys. Letters to the editor was a sort of interaction between reader and newspaper.

Great novels were first published as serials and then as books, reflected in recent years with the Internet as a renewed business model, for example with manga. It is the same with films and TV serials. So there is a temporal aspect with no predefined content. Waiting for the next episode is what we now call teasing and gamification. It was also the business model of the startup Openclassrooms¹⁵, with their first free online computer courses: sell the book that is used to support the training at the end of the course.

The 20th century has accelerated the democratization of books, notably with paperbacks¹⁶ (at the end of the 1930s) or *livres de poche*¹⁷ (in the 1950s).

From objects to service

With digital technologies and the Internet, new forms of books have appeared:

- Documents that can be picked up and redesigned
- Books giving access to their design process, such as Wikipedia, which shows the history of the article and discussions among contributors, but always remains unfinished
- Books as a service: the content can be designed in response to a request, taking into account various parameters (the book becoming a process, ceasing to be a physical object), for example Internet services that calculate road routes and enrich them with photographs or other information.

¹⁵ <https://openclassrooms.com/>

¹⁶ https://en.wikipedia.org/wiki/Pocket_Books

¹⁷ https://en.wikipedia.org/wiki/Le_Livre_de_poches

The hangman game provides a completely different example: not as a book enriched by digital technology but as a new kind of book allowing playing alone.

The hangman game becomes a book

*This ingenious twist on the classic word game is a hit, with over 250,000 copies sold in just a few months! And these two brand-new entries will have movie lovers and sports fans playing anytime and anywhere! Word lovers can take the challenge any time they want with this clever, solitary version of hangman.*¹⁸

The hangman game is a very traditional game played by generations of young children. A player thinks of a word and writes it by replacing each of the letters with a hyphen. The other player tries to guess the word by suggesting letters. If a letter is present in the word, the first player writes it in its place, otherwise it is 'lost'. With each letter lost, the first player draws one element of the gallows and the 'hanged man'. After seven errors, the 'man' is hanged.

With the Hangman book (Mike Ward), 'each page features one hidden word with 26 lottery ticket-like silver circles (one for every letter in the alphabet). Pick a letter and scratch to find out if and where it is in the puzzle. But watch out: six misses and you're hanged'¹⁹.

Figure 4 shows what a page looks like.

*Just like a scratch card, little silver dots on each page are set alongside the hangman on his noose and nine spaces along the bottom. Your goal is to fill in the missing letters at the bottom of each puzzle before the body in the gallows is completed. Scratch the silver oval below one of the letters of the alphabet and if the letter you get is correct, a number or more than one number, will tell you where to enter this letter in the word or words below. There are six parts to the body - two arms, two legs, the torso and the head. If you find all the letters in the complete word or phrase before you have to fill in the six body parts, you win! But if you miss six times, your head is for the gallows! 96 page pocket paperback.*²⁰

18 https://books.google.fr/books?id=cAA3bDmgTH0C&hl=fr&source=gbs_similarbooks

19 <https://www.abebooks.co.uk/SCRATCH-SOLVE-HANGMAN-BRIEFCASE-MIKE-WARD/18112295299/bd>

20 <http://www.bibliophilebooks.com/scratchandsolve>

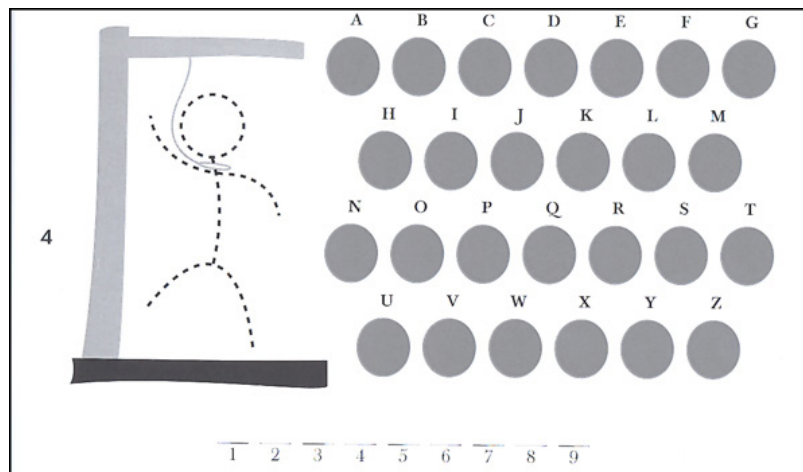


Figure 3. A page of a Hangman book²¹

This great commercial success is linked to the fact that a famous children's game may be played alone. It is described as an educational game (the expression 'serious game' is not used) for children and as relaxation for adults:

*... a great way for kids to practice and improve their spelling - all while they're having fun. It's also a great way for adults to take a quick mental break after a crazy day. And now everyone can play even when there's no friends around.*²²



Figure 4. Some examples of Hangman (or woman) paperbacks

Hangman became a series and a large number of different hangman (or hangwoman²³) books are offered. See for example the 22 different books offered by Barnes & Noble.²⁴

21 See image 3, <https://www.rainbowresource.com/viewpict.php?pid=034213>

22 <https://www.amazon.co.uk/Scratch-Solve-Travel-Hangman/dp/1402760167>

23 <https://www.bookdepository.com/Hangwoman-Mike-Ward/9781402774553> Why should the hangman have all the fun? Equal rights for the gallows have been granted and now puzzle-solving addicts can get their feminine fill with "Scratch & Solve[registered] Hangwoman"

24 http://www.barnesandnoble.com/b/books/word-games/hangman-word-game/_/N-8q8Z1hse

It seems that this series of books has met with great success in the USA. There is a French version offered in Quebec, but not yet sold in France. To understand why would be interesting. In addition, this example illustrates the well-known fact that newly emerging technologies do not replace older ones. Niche markets remain. This book could have existed for a long time because the technologies used have been mastered for a very long time. This shows that innovations, not relying on digital technologies, are still possible if we can associate them with social practices²⁵.

What could be a contemporary book?

This little detour through the Hangman game shows that the book, as an object, is still alive. One of its characteristics is that it can be read or used alone, its existence on the economic level requiring a wide distribution. Thus a book can have very many forms and its different avatars show that one can no longer think of it as a sort of unique model of reference. Another way of saying this is that the Internet and computer science have changed the modes of writing and are helping to revive the model of the book which, as we have seen, had already been profoundly modified even before computing.

How to define what a book is at the time of the Internet? Maybe we cannot separate the object and the way it can be used. Alan Liu from the University of California (Santa Barbara) has proposed a new way of thinking about books, defined as long forms of shared attention in the digital age:

Book = A long form of attention intended for the permanent, standard, and authoritative – i.e., socially repeatable and valued – communication of human thought and experience (usually through narrative, argumentative, or other programmatic organizations of bound-together-yet-discrete textual, graphic, and haptic elements)²⁶

According to this view, we can consider a book as an object or space in which we can live individually or collectively. A Mooc is a good example of a higher educational book.

Moocs as books

Considering Moocs as a contemporary form of educational book leads us to revisit or reinterpret the criticisms that have been made of Moocs, such as the large numbers of registered students with high dropout rates, the lack of tutors, the behaviour of participants, the personalization, and so on.

Table 1 summarizes Moocs discourses or phenomena, reinterpreted in the context of books.

²⁵ The hangman game joins the craze for scratch games, which now have their digital versions

²⁶ *This is Not a Book: Transliterations and Long Forms of Digital Attention*. <http://www.stef.ens-cachan.fr/version-francaise/seminaires-et-colloques/evenements-precedents/translitteraties-enjeux-de-citoyennete-et-de-creativite-234293.kjsp>

Books	Moocs
Sales	Number of enrolled persons
Purchase impulse	Registration, click
Bought books, partly or not read	Drop out, partial participation
Showing his books	Certificates
Read several ones	Following several ones
Private lesson	Tutoring
Reader behaviour, learning path	Traces
Personalized book?	Column (rubrics)
Scrambled books	Adaptive learning?
Learning outcomes	Learning outcomes

Table 1. Moocs discourses reinterpreted in the context of books

To comment quickly on this table, I admit that I have bought books that I did not read afterwards and that it has happened (very rarely) that I have twice bought the same book. But no one verified that I had actually read these books. I often read several books in parallel, entirely or only certain parts. Good booksellers try to sell you what they consider the best books and some of these will remain unread (just displayed on shelves). One never knows how many readers have read such and such a literary prize. Bestseller lists are published in the newspapers. I never use a tutor to help me read a book but I can interview someone if necessary and discuss a book with different people. I have never blamed an author for not having thought about my own reading needs and personalized his book for me.

Behaviour towards Moocs can be related to that towards books. Registration is an impulse buy. Cisel in his PhD thesis (Cisel, 2016) shows, from analysis of data from the FUN platform, that a very good predictor of dropout is enrolment behaviour, notably registration in bursts, inspired by marketing of the key-entry product (searching for a Mooc by theme), as opposed to the key-entry platform (choice among offers on a platform). For the moment, since books cannot trace their readers, no data can be automatically collected. Perhaps in the wake of the Mooc, the behaviour of readers will be the subject of scientific study.

In any case, when considering Moocs as books, and of course mainly textbooks, general issues do not disappear, but new avenues for research open up. Using the literature on self-learning, it has been confirmed that following a Mooc successfully requires very good self-management capabilities (Bruillard, 2017), but this does not imply that other devices need to be developed, nor that tutors are necessary 'inside' the Mooc. We can think about developing educational environments in which Moocs used as books are recommended.

The impact of Moocs is not limited to formal training. Informal learning can be based on forms of Mooc, not offered by large universities but by anyone. This can occupy the space of specialized magazines for those who have a passion (stamp collectors,

cooking, beautiful homes, antique cars, etc.), or who want to acquire skills (gardening, computers, etc.), as a continuation of the performance of the Youtuber for example.

A Mooc can be seen as an enriched and interactive book delivered in slices, including live discussions with other participants. How to learn with such a book? Maybe it is an opportunity to revisit some classical educational models. This way of thinking makes it possible not to oppose paper and digital but to reflect on the associated practices. We will look at two points that are particularly present in the Mooc and are central in all educational models: (1) control, appearing in quizzes and exercises, but also in the processing of interaction data and (2) conversation with peers, using social networks and forums.

Control v. Conversation: key elements in educational resources

The book is a technology that is a basis of our education process. Manuals or textbooks have played a key role in the expansion of instruction. Just take a deeper look at educational books.

The book is also a place of conversation with the past, which allows one to build one's knowledge. This aspect has been very present in school books and we will briefly recall it. After that, we will consider books as teaching machines.

Question-answer model: the catechetical genre in textbooks

According to Alain Choppin (2008), school literature comes from the catechism: the oldest textbooks reproduce the structure, presenting concepts through questions and answers, removing from teachers and pupils any initiative or effort of personal reflection. In fact, the form of catechetical exposition has not only been used for religious formation, but also in civic, political, and agrarian contexts, and so on.²⁷

In many 19th-century manuals we observe a continuous numbering (not using chapters) with some catechetical aspects: oral exercises specify questions from the teacher, with student responses. Simple reading was considered insufficient; an interaction had to be established between the book and its reader.

An interesting parallel can be drawn with the work of Eugenia Roldán Vera (Vera, 2001), concerning Ackermann's manuals in Early Independent Spanish America. These

27 « D. Qu'est-ce qu'un catéchisme ? R. Un catéchisme est l'explication raisonnée, par demandes et par réponses, et d'une façon simple et abrégée, des préceptes d'une croyance, d'une doctrine et, en général, de toute connaissance pouvant former un enseignement rudimentaire fondamental » : Élie Cassiat, *Petit catéchisme national*, Nevers, Mazon, ca 1900, p. 9. « Q. What is a catechism? A. A catechism is the reasoned explanation of the precepts of a creed, of a doctrine and, in general, of any knowledge capable of forming a basic rudimentary teaching, by questions and answers, in a simple and abridged way » (Choppin, 2008, note 87).

books 'were structured as a series of short questions and medium-length answers one after the other, forming chapters' (p. 23). The books were designed to be used in family circles rather than at school, and the catechetical genre appeared very appropriate for the diffusion of knowledge on a large scale.

Vera recalls that catechism, as a didactic method, has been associated with two main types of texts: philosophical dialogues, used also for reporting scientific theories (Galileo for example), and catechisms of Christian doctrine for the instruction of the clergy.

In the first type of text, dialogues served to present conflicting views with the didactic purpose of arriving at a convincing truth. The other type of text is based upon the interaction between different voices: the 'dialogues' or 'conversations' for the teaching of science and general knowledge to women and children (Vera, 2001, p. 24). One finds the idea of ingenuousness in television programs on science, with a dialogue between the ingenuous (naïve) character who asks the questions and the expert who responds.

Ackermann's catechisms can be considered as a didactic mechanism that allows for cheap and extensive diffusion of knowledge, suitable for the instruction of all sorts of knowledge on a large scale.

According to Vera, Ackermann clearly wanted to produce a new type of catechism, compatible with the monitorial or 'mutual' system, in which large numbers of pupils could be instructed under the supervision of a single master (Joseph Lancaster and Andrew Bell). In this way, it was possible to learn without the aid of teachers, and the monitorial system in schools was organized according to a system of education for the masses (p. 29)²⁸. The manual was used in primary and secondary education, most of which was organized under the monitorial system.

As proposed by Vera, we think that the concept of genre provides a valuable tool for the analysis of the production and transmission of books (including new forms of books) and knowledge²⁹.

Teaching machines and control

Elements of the history of teaching machines

The history of teaching machines (Stolurow, 1961; Benjamin, 1988; Bruillard, 1997) provides a complementary approach. According to Januszewski (2001, p. 33), Thorndike (1912) provided the rationale for teaching machines and programmed instruction:

28 The basic principle of this method is to ensure that pupils teach each other knowledge, using their textbook as a reference, for example.

29 This is not explored in this text.

If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print. Books to be given out in loose sheets, a page or so at a time, and books arranged so that the student only suffers if he misuses them, should be worked out in many subjects (Thorndike, 1912, p. 165)

This remark, often quoted in the literature of programmed instruction, characterizes the dream of many educators: to create books whose contents would only be revealed at the right moment, according to the reader's understanding, as attested by the actions he/she is asked to perform. If the book is an essential instrument of culture and education, simply making it available does not guarantee that the reader will derive all of the desired benefit. Reading is not sufficient; an interaction must be established between the work and its reader. But how can we manage the latter's progress through the printed contents when a book gives direct access to all its contents?

To develop such 'teaching machines', designers have developed treasures of imagination to make the reader act so that he himself guides his reading by comparing his own answers to questions with those proposed by the author (and to prevent 'cheating'). We know these devices, used in textbooks or in magazines: hide the answers at the end of the book or arrange them upside down; ask the reader to bring down a cache to give him/her time to mentally produce the answers requested; etc.

However, these different techniques do not make it possible to differentiate a course according to the answers of the learner. To do this, it is necessary to dissociate the logical structure from the content and the physical structure constituted by the printed pages. Many 'scrambled books' have been designed according to this model, following the programming principles stated by Crowder: presentation of information followed by a question offering several possible answers, each of which is associated with a page number to continue reading.

In a scrambled book, each page (or portion of a page) is a unit. The student begins on page 1 and is asked a question to which several alternatives are given. Depending on which alternative he selects, he is directed to a subsequent page where his error is corrected or where he is introduced to the next part of the sequence (Lawson & al., 1960).

The preface to such a course is very interesting (Crowder, 1958):

The presentation of the teaching of this book is as close as possible to a conversation between a tutor and his pupil. This book provides knowledge in small doses and verifies the reader's understanding through multiple choice questions; questions that the reader must answer in order to go further. A wrong answer leads to a more thorough examination of the point at issue; a good answer leads to the next unit of information and the related question...

In the same text, the (scrambled) book seems to have amazing powers:

The book we are presenting here is intended to play the role of the preceptor. Just like a flesh tutor, he will show you the way, bring you the necessary knowledge, and constantly ask you questions to judge whether you have understood ... This book will record your answers, will give you some more explanations when you will need it and, as soon as he realizes that you have assimilated what he has taught you, you will take a new step.

So, we retrieve the notion of conversation through a book: 'When you work with this book, it will seem that you are working with a tutor. The book will give you information, and you will often ask questions to ensure your understanding of the points studied. When you reply incorrectly, the book will help you correct your mistake before continuing your study on the following topics.'

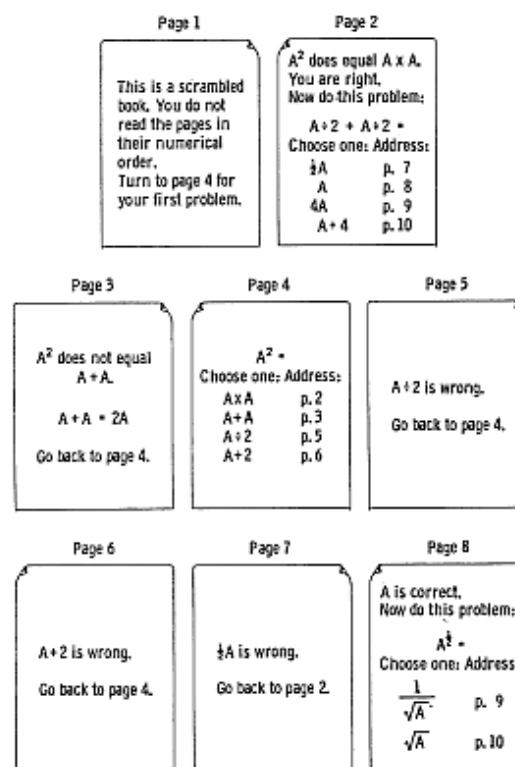


Figure 5. Presentation of a scrambled book (Stolurow, 1961, p. 39)

Dissociating the logical structure and physical structure and linking them by an addressing system led to computers, machines adapted to this task, which also prevent possible 'cheating'. Many CAL (computer assisted learning) software developers adopted the model of the scrambled book. These structures, arranged in such a way as to allow particular paths adapted to the progress of a learner, have disappeared. They survive only in the very special form of 'books in which you are the hero', which have nothing to do with education. These are adventure games that have appeared with computers.

The conversation device has not been forgotten and many designers of teaching machines have tried to establish a Socratic dialogue (for example, Cook, 1962).

From hypertext to digital textbooks via e-books

If a certain educational current has been interested in the invention of specific books, the emergence of new forms of reading supported by computer technologies was above all the work of the pioneers of hypertext. Instead of controlling the reader, they sought to extend the possibilities of exploration by opening up multiple paths through a set of documents (Bruillard, 1997). They imagined and designed personal (Bush MEMEX), collective (Engelbart) or even universal (Nelson) devices. These studies have been of great importance including the work of Xerox on the Dynabook (Kay and Goldberg, 1997; Goldberg, 1979) and the University of Brown (Yankelovich et al., 1985). The notion of an electronic book can be defined as an organized set of knowledge on a given subject, corresponding to a set of interconnected objects: texts, figures, logico-mathematical models, and indexes (Pasquier & Monnard, 1995).

In recent years, e-books have not been confined to university laboratories and are gradually conquering areas once dominated by paper. With the development of multimedia and the Internet, they integrate new possibilities and replace, supplement or extend printed books, from the closed (paper) aspect to the open (the Web). But it is the reading itself that is transformed, becoming a particular form of interaction with a reactive device.

Based on the conceptual model of the book, e-books benefit from the multimodal and hypermedia in their structure and the possibilities of navigation that they offer. It is a parameterizable and reactive device, able to respond to a reader's demands in a variety of ways. It is dynamic and adaptable, capable of modifying the form of a page as required for a particular reader or specific use, and capable of being 'opened up' (via the Internet).

These various characteristics show that we are far from the simple automatic or controlled turning of pages. However, from the educational point of view, there remains the tension between openness and control: (1) providing control of computer applications to the user with the metaphor of the book, or (2) providing the book with capacities of control over its reading or supposed understanding.

Digital books (Rodriguez et al., 2015) that have been developing internationally for several years are the heirs of e-books and hypertext.

Moocs: quizzes and forums, control and conversation

According to Stevenson (2015), one of the deep roots of Moocs runs back to the Lancasterian or monitorial learning system of Bell and Lancaster (Bowen, 2013), in a new attempt to provide affordable and massively-scaled education.

Obviously, this idea is based first and foremost on the possibilities of peer review and of collaboration, and in question-answer forms related to quizzes. The quizzes in a Mooc embody some aspects of the catechetical model. *But efficient students read the quizzes and look for elements in the videos to answer the questions as quickly as possible.*

The traditional opposition between cMooc (connectivists) and xMooc proved to be unproductive. According to Siemens, promoter of the connectivist model, the xMooc model emphasizes a traditional learning approach through video presentations, short quizzes and testing: 'cMOOCs focus on knowledge creation and generation whereas xMOOCs focus on knowledge duplication'³⁰. The cMooc / xMooc opposition may be replaced by an opposition between conversation (initially more developed in the cMoocs) and control via evaluation and analysis of interactions.

Back in the 1960s, there was a tension between collective and individual uses: texts could be read individually while videos were reserved for collective viewing or headphones to avoid disturbing neighbours.

Of course, conversational approaches to learning, derived from cybernetics for Pask (1978) or Laurillard (2002), should be explored. They are an interesting alternative to approaches to behavioural psychology, which seek to control learning.

But conversation is also the frequenting of works of the past (dialogue with leading authors via their books). It is not the controversy (Benmakhoulouf, 2014), but the opening against the decision, the judgment or the legal vision.

You have to get accustomed to seeing people around us only as books. The man of sense studies them, compares them and makes all of this a synthesis for his use.
(Flaubert, 1842, correspondence)³¹

With the book, the reader has full control.

Perspectives

It is still difficult to imagine how Moocs will evolve. Given their current public, the offer is now oriented towards companies and life-long learning, around technical apprenticeships, entrepreneurship, leadership, project management, and so on. In any case, new learning practices have emerged, new ways of consuming training, and they will continue to do so. It is not yet clear whether enthusiasm for the flipped classroom will be sustained, but the uses of the video will expand and the text no longer has the technological privilege of knowledge.

³⁰ <http://www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform/> (Blog of

³¹ <http://flaubert.univ-rouen.fr/correspondance/conard/lettres/42.html> « Il faut s'habituer à ne voir dans les gens qui nous entourent que des livres. L'homme de sens les étudie, les compare et fait de tout cela une synthèse à son usage. »

Technologies such as books and textbooks were designed for mass education, with specific forms of conversation. Control was mainly considered as personal and individual. The promises of the Mooc and of adaptive teaching revolve around a sort of oxymoron: the customized massive, that is to say, addressing a large number of users while providing specific elements for everyone, taking into account his/her wishes and learning path. However, the algorithms needed for this are far from being stabilized or even effectively designed.

On the Mooc side, we need to better understand the status of these new books and the ways they can be used in training, perhaps inspired by the Bell and Lancaster monitorial model. What pedagogy compatible with current social practices and norms will be invented? How to get a better understanding of massive collective activity?

As we have seen, the Q&A model was used in textbooks and could be adapted in mass education organizations. One can consider these artificial dialogues a far cry from a conversational model. Some Moocs now use chatbots or conversational agents and one can wonder about the quality of conversation that can be conducted. Would these conversational agents replace the advanced students of the Lancasterian model?

Regarding educational resources and the changes in textbooks, it seems to me unimportant to devote much time to the oppositions between paper and digital. Practices change and research has an important role to play in informing and understanding the changes that are underway. My point is that Moocs as books are a symptom of profound changes in education.

Finally, I propose a new definition of the Mooc as *a reactive document in a social interaction space that is temporally situated* – as both an object and a service, easing conversation (with the contents and with other participants) and including control (shared between the platform and the participants).

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