

# **A cross mapping activity showing the relationship between Information Literacy and cMOOCs**

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## **Abstract**

Information Literacy can be defined as knowing when and why one might need information, where to find it, and how to evaluate, use and communicate it in an ethical manner. Information literacy can be viewed as a set of skills that must be developed throughout a person's education. Information Literacy is stated as a fundamental basic human right and is the foundation for lifelong learning.

It is widely acknowledged that technology offers a chance to redefine, or at least change, learning and education for the better. Massive Open Online Courses (MOOCs) can be defined as learning events that are conducted via the Web, which can accommodate large numbers of people, typically ranging from a few hundreds of participants to over a hundred thousand. A classification of MOOCs suggests that there are two general types: xMOOCs and cMOOCs. Different types of MOOCs require different levels of participatory literacy skills, motivation and self-determinism.

The consideration and applicability of Information Literacy to the development and deployment of MOOCs is important. Information

literacy skills must be taught, developed, and continually reinforced at every educational level as a life skill. In addition, MOOC developers and facilitators should be duty bound to support and encourage learner participation, and to recognise the worth of the learning skills at work within the MOOC environment.

In this paper we adopt and apply the SCONUL model to a specific type of MOOC. In so doing we derive and present clear connections, which enables developers, facilitators and students to be more aware, and to have a better understanding, of the information literacy skills concerning the development and use of MOOCs. The long term benefit is that developers, facilitators and students become more information literate professionals and citizens in general.

**Keywords:** MOOCs, Information Literacy, Lifelong Learning, SCONUL

## 1.0 Introduction

Finding, evaluating, criticising, selecting and using relevant, accurate and useful information has been termed as Information Literacy.

At the National Forum on Information Literacy and Lifelong Learning, convened at the Bibliotheca Alexandrina, Alexandria, Egypt in 2005, the participants in the High Level Colloquium on Information Literacy proclaimed information literacy as a fundamental basic human right in the digital world: *“Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations”*. The exercising of this right would empower people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals [1]. The Chartered Institute of Library and Information Professionals (CILIP) define Information Literacy as “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner” [2].

The all-pervasive use of computers and the Internet in every facet of our personal lives and businesses has altered our lives at work and home. It has reshaped the landscape, and the functioning of the economy, health, industry, agriculture and many other spheres, including education. The phenomenon of Massive Online Open Courses (MOOCs) in education has led to a trend towards greater openness in higher education. A MOOC is an online course aimed at unlimited participation, self-regulated and open access via the web.

One of the possible salient challenges for some types of MOOCs is that participants require a certain level of digital and information literacy in order to

make use of the online materials. Thus to address this, and therefore augment the efficacy of MOOCs, as a means of delivering effective education, the development process for MOOCs must encompass information literacy instruction. MOOC developers and facilitators should be ready to find practices to support and encourage learner participation, and to identify the importance of the learning, literacy and digital skills at work within the MOOC environment [3]. Studies investigating the demographic profiles of characteristic MOOC participants indicate that they typically have good prior educational attainment, thus a high level of information skills, in order to successfully participate in a MOOC [4].

## 2.0 Types of MOOCs

MOOCs have been broadly characterised as being connectivist MOOCs (cMOOCs) or xMOOCs (the *x* term denotes transfer) [5]. Some developers, facilitators and researchers may argue that this is too simplistic a view and that MOOCs exist more in a spectrum as opposed to being categorised as one of two distinct types [4, 6]. The former, is based on principles from connectivist pedagogy; whereas the latter will typically centre on instructor-guided lesson(s).

### 2.1 xMOOCs

A learning management system will accommodate an xMOOC, which characteristically features recorded video lectures and machine-graded assessments. In addition, threaded discussion forums can possibly facilitate student interaction and the potential for peer graded assignments. Succinctly put learning activities in xMOOCs are mainly viewed as being *consumptive*. Content is prescribed by the developers, and participant mastery or understanding of the content is measured via tests, with almost no direct interaction between an individual participant and the instructor accountable for the course.

Although there are subtle, in some cases stark, differences between instances of xMOOCs, there are typically a number of common design features [5, 7, 8]:

- Computer-marked assessments: Typical xMOOC assignments are constructed on multiple-choice, computer-marked questions. Automated assessment procedures permit instantaneous feedback and student performance tracking. Although there are instances of experimentation with peer assessment, where more evaluative assignment questions can be used [8].
- Learning materials: Participants can download on demand video lectures. In addition, the xMOOC platform facilitates access to copies of slides, accompanying audio files, URLs to other resources, and online articles.
- Moderation: for most examples there is usually no or very light discussion moderation. Moderation will commonly be directed at all participants rather than to individuals. This is primarily a resource issue where due to the large cohort of participants, moderation of individual comments by the instructor(s) offering the MOOC is almost unmanageable. Thus, routinely participants moderate each other's comments or questions. xMOOC

platforms can provide for a shared comment/discussion space where participants can mail questions, request for help, or remark on the content of the course.

- Learning analytics: “big data” on participants and their respective performance can be analysed to flag areas where the content or design needs improving by instructors.

## 2.2 cMOOCs

Connectivist MOOCs are based on principles from the learning theory that is connectivist pedagogy [7, 9]. They are characteristically decentralised, with an emphasis on the *production* of content as opposed to the consumption. In this approach the participants are encouraged to pursue their own goals and forge their own learning paths, so traditional assessments are rare [3]. Therefore, unlike xMOOCs, cMOOCs do not make use of a formal teacher-student relationship, either for delivery of content or for learner support. Learning is facilitated through open and connected social media because cMOOCs are characteristically not institutionally based or supported, thus do not at make use of a shared platform(s). This permits autonomous learners to be networked with each other. This connection allows for a sharing of knowledge through participants’ personal contributions. The crucial design practice is that all participants contribute to and share content.

Although there are variations between instances of cMOOCs, there are typically a number of common design features [3, 9, 10]:

- The use of social media: cMOOCs will archetypally include a simple online registration system and the use of web conferencing tools to stream video and audio files, blogs and wikis. To allow participants to share their contributions, learning management systems, for example, Moodle can be used alongside Twitter, LinkedIn or Facebook in order to facilitate blogs, posts, tweets, or comments on other participants’ blog posts, wikis or open source online discussion forums, etc.
- Participant-driven content: participants constitute a community of practice and will determine, and thus contribute towards, what the content is to be. More often than not cMOOC organisers will invite experts in a given field to become potential participants in order to further discuss and debate topic.
- Distributed communication: For any single participant, there could be countless different interconnections between themselves and other participants. Keeping track of these at times may become very difficult, if not at times impossible. Many sub-conversations may emerge as a result of the interconnections. The key design practice then with regard to communication is a self-organising network with many sub-components.
- Students as assessors: In some MOOCs peer review is used by providing students with clear assessment criteria and then students assess a number of assignments of other students;

- Use of key-words: sophisticated technology is used that searches for keywords and provides generic feedback.
- ‘Cloud teaching assistants’: qualified assistants from around the world, who are paid by crowdsourced funding generated from optional post-completion certificates

### 2.3 Lane’s Classification of MOOCs

An alternative classification of MOOCs reveals three general types [11]:

1. **Network based:** “goal is socially constructed knowledge developed through conversation and exploration”;
2. **Task based:** “emphasise skill development through the completion of tasks”;
3. **Content based:** focus on transmitting content, usually automated assessment, don’t have to be participatory”.

This classification seeks to focus on the instructor/teacher who has designed the MOOC.

## 3.0 Outline of SCONUL

In order to assist librarians and teachers to effectively deliver information skills to their learners, models can be adopted. A model can be viewed as documentation that provides guidance in the understanding, development, and implementation of information literacy.

### 3.1 The SCONUL Model

The SCONUL Working Group on Information Literacy (Society of College, National and University Libraries) introduced the Seven Pillars of Information Literacy Skills model. The model has been implemented by librarians and teachers in order to aid them to deliver information skills to their learners. To maintain the relevance and efficacy of the model, with regards to meeting the changing needs of different user communities and ages, a revised model was published in 2011. This new model retained the generic core model for Higher Education, to which a series of “*lenses*”, representing the different groups of learners, can be applied. Figure 1 shows a representation of the model; the seven pillars organised into the following concepts [12]:

- **Identify:** Able to identify a personal need for information;
- **Scope:** Can assess current knowledge and identify gaps;
- **Plan:** Can construct strategies for locating information and data;
- **Gather:** Can locate and access the information and data they need;
- **Evaluate:** Can review the research process and compare and evaluate information and data;
- **Manage:** Can organise information professionally and ethically; and

- **Present:** Can apply the knowledge gained: presenting the results of their research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways.

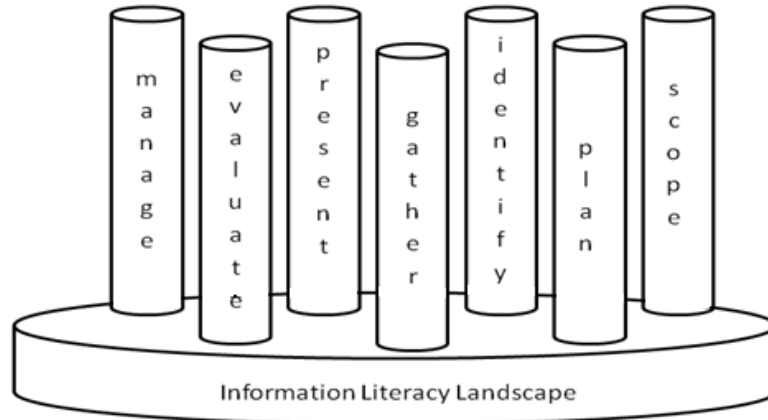


Figure 1: The Seven Pillars of Information Literacy, Adopted from [12]

The model can be viewed as a 3-D circular building. The foundation, upon which the pillars rest, is an information literacy landscape, which encompasses “*the information world as it is perceived by an individual at that point in time*”. The learner’s perception, informed by their aptitude, background and experiences will affect how they respond to any information literacy development.

The process of becoming information literate is not linear in nature but circular, where a learner can be developing within several pillars “*simultaneously and independently*”; although in practice they are often closely linked. There are a series of statements relating to a set of skills/competencies and a set of attitudes/understandings used to describe per pillar, listed above. As a learner becomes more information literate, measured by their ability to demonstrate more of the attributes in each pillar, they progress towards the top of that pillar, presented in Figure 1. Therefore, within each pillar an individual learner can grow from “*novice*” to “*expert*” as they step forward through their learning life. It should be noted that in some instances it is possible for a learner move down a pillar as well as progress up it.

For different user communities a specific lenses can be developed, which “*highlights different attributes, adds in more complex or simpler statements and uses language recognised by the specific community which it represents*”. This endows the model with flexibility enabling learners and teachers to adapt it to specific personal circumstances.

## 4.0 Applying SCONUL to cMOOCs

Four key cMOOC learning activities are [7, 10]:

1. Aggregate (filtering, selecting, and gathering personally meaningful information)
2. Remix (interpreting the aggregated information and bringing to it personal perspectives and insights)
3. Repurpose (refashioning the information to suit personal purposes); and
4. Feed Forward (sharing the newly fashioned information with and learning from other participants)

The four learning activities in cMOOCs, listed above, are crossed mapped with the SCONUL 7 Pillars Information Literacy model. To investigate this further, the seven pillars and the *skills set* indicators for each were examined and mapped according to the applicable cMOOC learning activity. Some connections between the learning activities and skills set indicators showed direct/strong correlation, whereas in some instances there was weak/no association. These connections are presented in Figure 2, see Section 5. The weak associations have been highlighted.

## 5.0 Findings

The seven pillars of the SCONUL model entries were compared to the four activities defined in cMOOCs, i.e. Aggregate, Remix, Repurpose and Feed Forward. These activities were cross mapped to the Association of College and Research Libraries (ACRL) standards [3].

The connectivist pedagogy that underpins cMOOCs dictates that participants are primarily expected to select among material supplied by facilitators or generated by other participants [8, 9]. This is borne by the SCONUL skills sets, related to *search* criteria, which poorly correlate to any of the four cMOOC activities. However, with SCONUL skills sets, related to evaluation and communication, are concerned then there exist very strong correlation one with a number of the cMOOC activities. Both these observations also concur with the findings reported on the ACRL literacy model when cross mapped with the cMOOC activities [3].

The findings also flag an issue of poor correlation between SCONUL skills sets, related to social, ethical and legal issues and cMOOC activities. The cMOOC design paradigm lends itself to be more open access thus issues concerning, for example, data protection, copyright and plagiarism can be more prevalent, an issue that must be considered more so for facilitators/content creators. In addition, whereas with xMOOCs the content is to a high degree prescribed by the developers, typically standards of conduct for academic integrity are embraced. This important aspect can be lacking in cMOOCs.

Aggregate [A]	Remix [RM]	Repurpose [RP]	Feed Forward [FF]	Weak/No Correlation		
The SCONUL 7 Pillars [12]						
Identify	Scope	Plan	Gather	Evaluate	Manage	Present
<p>Identify a lack of knowledge in a subject area [A]</p> <p>Identify a search topic / question and define it using simple terminology [A]</p> <p>Articulate current knowledge on a topic [A]</p> <p>Recognise a need for information and data to achieve a specific end and define limits to the information need</p>	<p>“Know what you don’t know” to identify any information gaps [A]</p> <p>Identify which types of information will best meet the need [A]</p> <p>Identify the available search tools, such as general and subject specific resources at different levels [A]</p>	<p>Scope their search question clearly and in appropriate language</p> <p>Define a search strategy by using appropriate keywords and concepts, defining and setting limits</p> <p>Select the most appropriate search tools [A]</p>	<p>Use a range of retrieval tools and resources effectively [A]</p> <p>Construct complex searches appropriate to different digital and print resources</p> <p>Access full text information, both print and digital, read and download online material and data [A]</p> <p>Use appropriate techniques to collect new data [A]</p>	<p>Distinguish between different information resources and the information they provide [A]</p> <p>Choose suitable material on their search topic, using appropriate criteria [A]</p> <p>Assess the quality, accuracy, relevance, bias, reputation and credibility of the information resources found [RM]</p>	<p>Use bibliographical software if appropriate to manage information [RM]</p> <p>Cite printed and electronic sources using suitable referencing styles [A]</p> <p>Create appropriately formatted bibliographies [RM]</p>	<p>Use the information and data found to address the original question [RM]</p> <p>Summarise documents and reports verbally and in writing [RP]</p> <p>Incorporate new information into the context of existing knowledge [RM]</p> <p>Analyse and present data appropriately [RM]</p> <p>Synthesise and appraise new and complex information from different sources [RP]</p>



Aggregate [A]	Remix [RM]	Repurpose [RP]	Feed Forward [FF]	Weak/No Correlation		
The SCONUL 7 Pillars [12]						
Identify	Scope	Plan	Gather	Evaluate	Manage	Present
Use background information to underpin the search [A]	Identify different formats in which information may be provided [A]	Identify controlled vocabularies and taxonomies to aid in searching if appropriate	Keep up to date with new information [A]	Assess the credibility of the data gathered [RM]	Demonstrate awareness of issues relating to the rights of others including ethics, data protection, copyright, plagiarism and any other intellectual property issues	Communicate effectively using appropriate writing styles in a variety of formats [FF]
Take personal responsibility for an information search	Demonstrate the ability to use new tools as they become available [A]	Identify appropriate search techniques to use as necessary [A]	Engage with their community to share information [FF]	Critically appraise and evaluate their own findings and those of others [RP]	Meet standards of conduct for academic integrity	Communicate effectively verbally [FF]
Manage time effectively to complete a search		Identify specialist search tools appropriate to each individual information need [A]	Identify when the information need has not been met [RM]	Critically appraise and evaluate findings of others [FF]	Use appropriate data management software and techniques to manage data [RM]	Select appropriate publications and dissemination outlets in which to publish if appropriate [FF]
			Use online and printed help and can find personal, expert help [FF]	Know when to stop		Develop a personal profile in the community using appropriate personal networks and digital technologies (e.g. discussion lists, social networking sites, blogs, etc.) [FF]

Figure 2: cMOOC Learning Activities Mapped to SCONUL 7 Pillar Information Literacy Skills Set

## 6.0 Conclusion

The rationale of adopting and applying the SCONUL model to a specific type of MOOC was to draw clear connections between information literacy and cMOOCs. In doing so the authors conclude that the importance of information literacy can be brought to the attention of the MOOC community.

Mapping the relationship between the learning activities and the information literacy standards provides a tool to help raise the visibility of information literacy [3, 6].

In an in depth contribution to the debate about learning design for Open Learning and in particular for MOOCs, a number of suggested areas requiring further investigation and development have been suggested [13]. Some of these suggestions include the development of metrics to assess gain in cognitive and non-cognitive skills that can be applied outside of the MOOC environment, comparison of skill or knowledge acquisition through MOOCs vs. regular online or face-to-face courses, follow-up of post-MOOC outcomes such as sequential learning experiences or employment opportunities gained, broadening the types of learners represented in studies of MOOC activity and impact in order to avoid the presentation of results that are not applicable to the majority of learners.

Future work will seek to concentrate on developing a cMOOC for Valorisation of Projects. The VALO project was initiated and developed in order to create awareness of the needs for an integral mechanism to maximise the dissemination, exploitation and sustainability of project results for high quality outcomes and added value [14]. In the longer run a comparison of existing results from face-to-face delivery of the Valorisation Expert Course, which delivers such best practices required to analyse, define and implement potential valorisation strategies [15]; and results to be obtained through a MOOC delivery will be reported on.

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