

Responding to the Networked Student: the impact of integrating MOOCs into campus-based modules.

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Abstract

The use of Massive Open Online Courses (MOOCs) as part of the Higher Education landscape is continuing to expand with over 1500 courses started in May 2017 alone ([Class Central, 2017](#)). In some cases, these courses are becoming integrated to such an extent that they are being incorporated in the on-campus curriculum. Originally externally-facing MOOCs are increasingly being used as part of face-to-face modules, often with the aim of leveraging the networked learning opportunities that these kind of open courses offer.

There are a range of MOOC integration models which can be applied to on-campus modules. These include integrating a MOOC fully into the module learning design in innovation modules (potentially including making participation an assessed element), integrating a MOOC as one of many module resources in a traditional module, and integrating a MOOC as a revision tool to support lecture content. Equally, the role of on-campus learners can vary from mere participants in the MOOC to teaching assistants or content producers.

Framed within a Socio-technical, Connectivist paradigm, centred on the development of student's Personal Learning Networks, this research will report on the effect of two of these models on student's attitudes to learning and the impact on their module achievement. Employing a mixed methodology, the attitudes of the students to the integration of the MOOCs was measured through the use of pre- and post-module surveys hosted on the University of Southampton's online iSurvey tool; informal, semi-structured interviews; formal module feedback; and written reflections. This data was analysed empirically and thematically. The impact of MOOC integration on achievement was measured through an empirical analysis of module results profiles.

The findings suggest that regardless of the integration model, students value the MOOC as a convenient, flexible and accessible way to study where and when they choose. More importantly, the students report that the primary value of an integrated MOOC is that it helps them to understand the module content more deeply. This is due to a combination of the use of multimedia resources, the increased global and local opportunities to interact with a community of interested others, and the fact that it is not a lecture (57% of students reported learning more from MOOCs than from lectures). However, there remains a small number of students who, despite programmes of support, do not respond positively to MOOC integration, instead considering it to have little or no benefit to their learning or to be a waste of time.

The findings also indicate that while the Revision integration model led to a three percent increase in the module grade average (from 59% to 62%) and a doubling in the number of firsts

awarded, the same was not the case for the Full Integration model. This may have been due to the fact that inadequate account had been taken of the specific context of that module and insufficient MOOC and digital literacies support was provided. Equally, it may indicate that the integration model matters, with MOOCs being used to reinforce the learning gained during traditional face-to-face lectures being the most effective integration model.

Introduction

The World Wide Web has already had a transformative effect on most aspects of modern life, work and education, and Higher Education Institutions (HEIs) have not been exempt from this process. Sir Tim Berners-Lee (2000) originally conceptualised the World Wide Web as a system for physicists and researchers to share their findings and thereby learn from one another. Hence from the outset the Web was designed to be a global learning tool. Since then, the impact of the Web on education has continued to grow at a significant pace and the HE landscape, in the UK and Europe at least, may best be viewed as consisting of networked individuals (Raine & Wellman, 2012) living, working and learning in a network society (Castells, 1996). It is not surprising therefore that the Innovating Pedagogy Report (Sharpley et al, 2014) identified “*massive open social learning*” as the innovation most likely to have a significant impact upon education. A view supported in the 2017 NMC HE Report (Becker et. al., 2017) which identifies in its ten key findings that “*online, mobile and blended learning are foregone conclusions*” and that “*lifelong learning is the lifeblood of higher education*” (ibid.). It argues that institutions which do not “*have robust strategies for integrating*” these approaches to teaching and learning “*simply will not survive*” (ibid.). The message is clear – adapt to the centrality of networks to modern life and academia, or die.

It is unsurprising therefore that a plethora of formal and informal, profit and not-for-profit online services targeted at teaching and/or learning have continued to spring up in the years since the creation of the Web. Massive Open Online Courses (MOOCs) form one type of online teaching and learning approach and have now begun to move from an emerging technology to a maturing feature of the educational sector. A 2013 review of MOOCs by the UK’s (then) Department for Business, Innovation and Skills (BIS) suggested that,

“There is consensus that MOOCs, correctly deployed, do offer education institutions a useful lever for restructuring and transition. On balance, the literature expresses the view that MOOCs will probably not threaten traditional forms of University teaching in the short term, but a significant sub-group of credible writers foresees wide and sudden changes and disruptions to HEIs from MOOCs.” (Haggard, 2013, p.6)

In the years since the review, forward thinking HEIs have begun to move beyond a focus on online resource / content storage through an institutionally operated Virtual Learning Environment (VLE), towards harnessing the potential of digital technologies to support social, collaborative learning on a global basis. A growing number are putting MOOCs at the heart of their online education strategy as the building blocks of flexible, networked curricula and

collaborative partnerships (e.g. the Universities of New South Wales and Deakin in Australia, and most recently Leeds and Coventry Universities in the UK). Every programme in UNSW is developing an integrated curriculum framework that combines free MOOCs, traditional modules and professional development elements according to its specific requirements. However, this forward thinking is not yet typical across the HE sector generally.

MOOCs were primarily conceived as externally facing educational initiatives in HEIs (Davis et.al. 2014) (although they have subsequently also been used internally as testing grounds for educational innovation (Leon, et.al. 2015)). The most common model for the development of MOOCs is a partnership between HEIs and bespoke platforms, such as FutureLearn, Coursera, or EdX, who host the educational content produced by the HEI's academics, and provide them with a specific interface. There is another model by which a university produces a course and the materials and activities of which are distributed across different applications, usually through social media. These two formats have been categorised as xMOOCs and cMOOCs respectively (Rodriguez, 2012). Both formats have the university as the content provider, and as a key stakeholder, and have the potential to *“drive innovation and experimentation, leading to improved learning and lower costs and a managed restructuring”* (Haggard, 2013, p.6) for the HE sector.

Mainly due to the fact that these courses are massive and open, many opportunities have been identified as a result of the integration of these courses within on-campus modules. However, as the BIS Review (Haggard, 2013, p.6) suggests, *“There is as yet no agreed satisfactory system of measurement for assessing the quality of MOOCs from the learners’ point of view”*. This research therefore aims to contribute to the growing body of knowledge by evaluating the effectiveness of integrating MOOCs into on-campus university modules. The objective is to explore student attitudes to the integration of MOOCs into their modules and to investigate whether blending MOOCs into modules in a variety of models positively impacts student achievement. It will begin with a brief history of MOOC developments and other research in this field, before a discussion concerning the networked student and what it means to learn in the current HE context. It will then report on the findings of this research and evaluate the integration models and lessons learned.

MOOCs - a brief history

Although the first courses categorised as MOOCs did not include campus-based students, they did integrate enrolled paying students with open online learners (Downes, 2008). Downes reported on the experience of a course entitled Connectivism and Connective Learning, in which one version of the course featured a paid enrolment, capped at 25 online students, and another version was free and had an enrolment of nearly 3000 learners. As a manifestation of Connectivism (Siemens 2005a, 2005b, 2006, 2008; Downes, 2005, 2006, 2007a, 2007b, 2008), learners in both versions interacted with each other through a set of distributed open online tools, mainly chats, blogs, and even in virtual worlds such as Second Life.

A different approach to the open online course flourished a few years later. In 2011, leading universities such as MIT and Stanford started to liaise with MOOC platform providers such as EDx and Coursera to offer platform-centered courses to tens and even hundreds of thousands of students (Davis et.al. 2014). These courses were categorised as xMOOCs, as opposed to the above described connectivist MOOCs (cMOOCs) (Rodríguez, 2012), and many universities adopted them as part of their strategy. Both cMOOCs and xMOOCs are open, online and externally facing. This feature motivated many universities to adopt them for achieving outreach and visibility (León et.al. 2015), but there were other drivers. For example, MOOCs provide opportunities to interact with high numbers of learners other than those on-campus (ibid), as well as opportunities for educators to wrap their materials in flipped and blended learning experiences on-campus (Koller, 2012).

At first glance, it could appear that early connectivist MOOCs were conceived as interactive experiences between university learners and a wider, diverse learning community, whereas later platform-centered xMOOCs ran the risk of being perceived as a subtle means of Western expansion and digital colonialism (Daniel, 2012). However, while an unintended consequence of early MOOC activity may have been to push Western knowledge and understanding onto a global audience, MOOCs are no more colonial than the English language based Web in general. Furthermore, with time and understanding MOOC producers can attempt to mitigate against this hegemony through intelligent design, for example, the EMMA European Multiple MOOC Aggregator with its translation capabilities, the introduction of COOCs (Community Open Online Courses – see www.coocs.co.uk for more), or the Italian language Federica.eu MOOC platform.

In addition, there is variation between the connectivity offered by courses and platforms within the xMOOC model, with some resembling more a set of materials hosted online (e.g. Coursera) while others make extensive use of the comments sections to stimulate dialogue and interaction (e.g. FutureLearn), hence all xMOOCs cannot be considered the same. It may also be the case that sometimes MOOC participants themselves voluntarily choose to connect with coursemates through alternative platforms. For example, a learner on the Learning in the Network Age MOOC (FutureLearn / University of Southampton) chose to start a Facebook page for the MOOC with the express intention of providing a means for interested learners and the educators to stay in contact once the MOOC was ended. Many MOOCs also feature a course Twitter hashtag to provide non-platform-based communication avenues, or include links out to quizzes, surveys or other learning activities hosted on third party platforms. Consequently, there is an increasing blurring of in-platform communication and activity and out-platform interactions, making the XMOOC landscape more nuanced than previously thought.

In summary, MOOCs in 2017 can mainly be considered as platform-centred services developed in partnership between a MOOC provider and a university, and located at different points along the spectrum of strict xMOOC to strict cMOOC according to appropriacy, capability and intent. They are primarily externally facing resources, but are starting to become used for internal purposes. As such, they provide fertile ground for providing a gateway through which

universities can transition towards an HE teaching and learning experience suitable for the networked student.

Understanding the Networked Student

During the 1990's a number of sociologists began to position networks as a new approach to social organisation (e.g. Castells, 1996, Wellman & Hampton, 1999). At this time, networks, driven and empowered by technology and the Web, offered the potential to undermine structural hierarchies, disrupt information and knowledge elites, and redistribute power and influence. As Castells (1996, p.500) stated, "*Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture*" leading to a "*shift from living in 'little boxes' to living in networked societies*" (Wellman & Hampton, 1999, p.648). This networked society was to be characterised by the opportunity for personal, diverse and self-directed interactions across multiple networks where traditional social boundaries would become more permeable and long-standing social inequalities would be bypassed.

Applied to education, this view challenged traditional educational norms, hierarchies and power elites. Among many other things, the didactic transmission of the knowledge and information hoarded within the mind of an elite expert (the teacher), would be undermined by students from any socio-economic and contextual background who could actively use their network to discover (or challenge) that knowledge/information for themselves. In addition, the centrality of the physical classroom located within a physical institution would be weakened as networks provided access to a global set of resources at any time or place of the student's choosing. Furthermore, the reliance on individual assessment would become increasingly at odds with the practices of the networked student used to collaborating, communicating and sharing with the diverse people and resources within their network. In short, HE education would be fundamentally challenged by the rise of the networked society (Castells, 1996) and networked individualism (Rainie & Wellman, 2012) and traditional learning theories and practices would need to adapt to this new social reality.

Many of these challenges have come to pass over the last twenty or so years, and indeed this research (and book) represents a small part of an ongoing attempt by HE institutions and educators across the world to adapt appropriately to the fundamental challenges that networks have presented to education. The first area to explore is the 'nature' of the networked student. Given the near ubiquitous access to technological devices and the Web available to an on-campus HE student (in the UK and Europe at least), many students are likely to arrive at university having developed a co-dependent relationship with a range of technological devices and services which they use for a diverse range of daily activities, including learning (albeit often informally).

In other words, the networked student has an existing Personal Learning Network (PLN), on which they have developed an almost total reliance for conducting many aspects of their lives. This interdependence between an individual student and the devices, technologies and services

they use for learning in all contexts (formal, non-formal and informal) can be understood with reference to Socio-technical Theory. Developing from Science and Technology Studies (e.g. Bijker et al, 1987; Hughes, 1987) and the concept of Generalised Symmetry espoused by Actor Network Theory (e.g. Callon, 1986, Latour 1987, 1990; Law, 1992), a socio-technical system may be best defined as one which *“focuses on the interdependencies between and among people, technology and the environment”* (Cummings, 1978). In short, *“the social and the technical are embedded in each other”* (Law, 2008, p.147) to such an extent that one can not be fully understood without reference to the other.

As such, a student and their Personal Learning Network (PLN) becomes a socio-technical system where both face-to-face (human) and digital (non-human) interactions are undertaken continuously, and where all those interactions are equally important to achieving a desired aim. Indeed, emerging research indicates that just twenty-six percent of all interactions throughout any given day are face-to-face, while the remaining seventy-four percent are with technological devices (mobile phones 33%; laptops 21%; PCs 11%; tablets 9%) (Fair, 2019). This indicates the extent to which the networked student has developed a socio-technical interdependence with their technologies through the creation and use of their PLN. In simple terms, this means that for HE teaching and learning in a network society, both the learner and learning can not be considered separately from the technologies used for learning purposes and the learning network they have constructed for those purposes.

The recognition of the central, co-dependent role of networks to learning has fundamentally challenged what it actually means to learn in a network society. After decades of intense, but ultimately inconclusive, debate between Behaviouralists, Cognitivists and Social Constructivists (e.g. Skinner, 1953; Piatelli-Palmarini, 1980; Chomsky, 2006a, 2006b; Vygotsky, 1978) on this question, a new learning theory – Connectivism (Siemens 2005a, 2005b, 2006, 2008; Downes, 2005, 2006, 2007a, 2007b, 2008), – emerged in response to the challenges to traditional education resulting from the rise of networks. Connectivism suggests that *“the capacity to form connections between sources of information, and thereby create useful information patterns, is required to learn”* (Siemens, 2005b, p.4) and that *“knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks”* (Downes, 2007a).

Consequently, learning in a networked society has become a process of autonomously building, maintaining and using a Personal Learning Network (PLN), which consists of multiple connections to diverse people, information and resources, accessed through both digital technologies and more traditional (offline) means. This understanding of what it means to learn challenges the traditional function of HE teaching and learning - content delivery – by arguing that the development of digital literacies and networking skills is at least as important to learning as ‘knowing stuff’. Expressed in Connectivist terms, *“content ought to be subservient to discussion”* (Downes, 2007b, p.5), the *“capacity to know more is more critical than what is currently known”* (Siemens, 2005b, p.5), and the benefits of *“pattern recognition and connecting our own ‘small worlds of knowledge’ are apparent in the exponential impact provided to our personal learning”* (ibid., p.6).

Essentially, learning within a networked society is simultaneously *Individual*, as it is centred on an individual's learning network, *Socio-technical*, in that it consists of interaction with human and non-human others equally and inseparably, and *Networked*, in that it involves making connections and identifying patterns and requires literacies and skills as well as knowledge. Within this Socio-technical, PLN, Connectivist paradigm, the integration of MOOCs into on-campus modules is ideally suited to both accessing and interacting with content *and* to the development of student's learning networks (PLNs), digital literacies and knowledge.

However, it is also important to note that the early utopian promise of networks as a force for the democratisation and disruption of power has not materialised as fully as expected. As has just been discussed, networks have delivered some serious challenges to traditional educational norms, but Web Scientists and Sociologists have also shown that pre-existing offline inequalities are reflected in the uneven level of network development and digital literacies seen across the HE student body (e.g. Halford et. al, 2010; Orton-Johnson & Prior, 2013; Daniels et. al. 2016). While all HE students today are networked, they are not all networked to the same extent, nor do they all have the same digital literacies and skills. Although many students may be categorised as 'tech-comfy' – able to comfortably use digital technology for socialising and entertainment (the majority), far fewer can be considered 'tech-savvy' – able to produce and distribute digital content (the minority) (Pegrum, 2011). Similarly, a networked student may fall anywhere on the Digital Resident – Digital Visitor spectrum (White and Le Cornu, 2011) depending on their online behaviours and motivations. These behavioural and motivational differences have been found to reflect a wide range of offline factors including:

- gender (e.g. Whitmarsh, 2015, Wei et. al., 2012)
- point in one's 'life course' and who your friends are (Robinson et al, 2015; [Rongbuttsri et. al., 2011](#) ; [Thomsen et. al., 2016](#)),
- culture, race & ethnicity (e.g. [Mesch & Talmud, 2011](#)),
- English language proficiency ([Ono & Zavodny, 2008](#)),
- socio-economic level & class (e.g. [Witte & Mannon, 2010](#) ; [Pew Research Center, 2018](#); [Ofcom, 2017](#)),
- location / nation / urbanisation ([Pew Research Center, 2018](#)),
- (dis)abilities (e.g. [Watling, 2011](#)),
- educational level, experience and context (e.g. [Pew Research Center, 2018](#); Davies, 2015 ; [Ofcom, 2017](#); [Coiro et al., 2008](#))
- existing social capital / habitus (e.g. Costa, 2015; Davies, 2015).

These offline factors result in digital differences in online behaviours and differences in the size and use of student's networks. As such, it is impossible to consider the networked student as a single homogenous group. Rather, the HE student body today should be viewed as a collection of unique individuals who is each located at the centre of their own Personal Learning Network.

However, those networks vary greatly in the type and extent of the connections within them (Fair, 2019). They are also used in different ways by different people in different contexts for different purposes. As such, the integration of MOOCs into mainstream HE teaching and learning must be accompanied by a considered programme of digital literacies and networking skills support if it is to avoid disadvantaging students with less developed networks and digital literacies.

As the department for Business, Innovation & Skills (BIS) stated of the situation in 2013, and as often remains the case today, *“Most studies show that the MOOC experience demands skill and aptitude in online social networking, and that these baseline capabilities are not [yet] widely enough shared”, that “the literacies and skills required to benefit from MOOCs are very specific....[and]...it is also likely that primary and secondary education curricula are not addressing these learning skills adequately”, and that “the networking, reputational and learning skills that MOOC environments require for successful learning are an important issue.”* (Haggard, 2013, p.8). It is therefore highly likely that not all learners on a module featuring the integration of a MOOC would have the same digital behaviours and motivations, nor the same level of digital literacies and networking skills, even within an apparently homogenous single on-campus undergraduate cohort. So, although the integration of MOOCs into on-campus modules presents an excellent opportunity for responding effectively to the networked student's educational needs and expectations, existing research makes clear that student's digital differences must be adequately accounted for in the module's learning design and MOOC integration model.

MOOCs in the classroom

There have been a number of initiatives experimenting with the incorporation of MOOCs in on-campus modules (e.g. Sandeen, 2013). These experiences have been shared in a corpus of literature, some of which, identified by Israel et. al. (2015) are worth highlighting. For example, Caulfield et. al. (2013) report on the experience of using a Stanford MOOC as learning material in a module at a Puerto Rican university. Both the learners and the teacher benefited from the high quality materials (videos, articles, and quizzes), although the learners did not engage in the MOOC forums. Bruff et. al. (2013) also used a Stanford MOOC in their university -Vanderbilt-, integrating it into their module with similar results. The learners in the module were encouraged to participate in all aspects of the of the MOOC, and they did so in all of them except the forums. Another experience shared was that of Holotescu et. al. (2014), who integrated a few MOOCs from different universities in a local Learning Management System in their own institution, the Polytechnic University of Timisoara. The experience was deemed as generally positive, mainly because of the opportunity of leveraging a wide choice of materials from a wide range of MOOCs. Andone (2015) repeated the experience with a similar approach in the same institution. In both cases, several learners reported to have benefited from the participation in the interaction spaces offered by the different MOOCs in which they participated, although the most used interaction tool was the one put in place by the university, not the one put in place by

the MOOCs themselves. Therefore, there was interaction through the use of MOOCs, but there was not much interaction between the university learners and the wider MOOC participants.

The last case to be reported here is that of **Griffiths (2013)**, who used a series of MOOCs in on-campus modules as an experiment over two years. Unlike the previous cases, most of these MOOCs were created by the same university - University System of Maryland - and they were used as part of the syllabus. The results were generally positive, but students expressed dissatisfaction with the quantity of face-to-face interaction in the module, as they perceived that much of the face-to-face settings were replaced by online settings. This may indicate that prior expectations (and/or educational conditioning), such as expecting a suitable amount of face-to-face exposure to an 'expert', may lead to tension in these types of socio-technical approaches.

The Interventions

Having framed MOOC integration within theoretical and research perspectives, we will turn to the interventions which formed the research projects reported on here. The objective of our research was to investigate the impact of the integration of (up to) two University of Southampton FutureLearn MOOCs - [Learning in the Network Age](#) and [Power of Social Media](#) into on-campus modules. The aim was to explore the attitude of the students to this application of MOOCs, and to investigate the effects the integration may or may not have on module achievement. The MOOCs were integrated into two modules according to two distinct models. The first was a single MOOC integrated fully into the module as a topic source, a general resource and a space for interaction. The second model was the integration of two MOOCs as a revision tool in the final four weeks of the semester prior to examinations, where some aspects of the exam questions were related to MOOC content, which in turn reflected content covered earlier in the semester during traditional lectures (see table 1 below for details). In both cases however, learners were expected to engage with the MOOC only as active participants (commenting and interacting with others, but not producing content or facilitating the course) and engagement was not a formal assessed part of the modules. Nevertheless, in order to achieve the best possible module outcomes, participation in the MOOC was expected and strongly advised. Details of the two modules and the MOOC interventions can be found in the table below.

Module Name (Course Code)	Location (cohort size)	Module Duration	Face-to-face Support	MOOCs	Integration Model
Online Social Networks (UOSM2012)	Southampton (47)	Whole semester	4 classroom workshops over 4 weeks	Learning in the Network Age Power of Social Media	Revision activities for final 4 weeks of the module

Living and Working on the Web (MANG2049)	Singapore (61)	3 weeks	Daily online Google Hangouts	Learning in the Network Age	Fully integrated into course content
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Table 1: The modules, MOOCs and integration models used

A mixed method of data collection and analysis were employed. The attitudes of the students to the integration of the MOOCs was measured through the use of pre- and post-module surveys hosted on the University of Southampton’s online iSurvey tool; informal, semi-structured interviews; formal module feedback; and written reflections. This data was analysed empirically and thematically. The impact on achievement was assessed through a statistical comparison of module results year-on-year, for both modules. However, the modules were, of course, different – different in size, location, people, assessment method, duration and context. This naturally makes accurate comparison difficult. Hence rather than being definitive, this study presents an impression, a sense, of the impact of MOOC integration on on-campus HE learning.

In line with the understanding of digital differences discussed earlier in this chapter, already existing learning support methods were adapted to include specific support for MOOC participation. Hence, the timetabled face-to-face workshop sessions (for students on the Southampton campus) were repurposed to provide a more structured setting for participating in the MOOCs (as opposed to being used for independent self-study), where peers were on hand, and an educator present. It was felt that this would help to encourage offline networking and situated social interactions to complement those occurring online. In addition, the inclusion of the educator (as facilitator - there to assist with any technical issues and to guide any in depth discussions arising from the MOOC content), was also intended to be reassuring to learners with more traditional expectations. For the Singaporean cohort, daily Google Hangouts were used for MOOC support in a similar way, although technical limitations reduced the capacity for student/educator discussion and as the students were not co-located there were equal limits to the level of peer interaction during these support sessions too.

Module Overviews

It is necessary to now briefly explore the particular design and contextual aspects of the two modules under study in order to frame each intervention effectively. Firstly, the ‘Living and Working on the Web’ module at the Singapore campus (MANG2049) is an innovation module, open to undergraduates from the Business School. It is based entirely online and features a continuous assessment cycle of ‘blog-comment-reflect & self-assess’. The module runs for just three weeks, hence the assessment cycle repeats every three to four days, with a new topic for each cycle. The main routes of educator-student-student interaction is through daily Google Hangouts, through the course blog and the student’s blogs themselves, and through social media (specifically Twitter #mang2049). There are no lectures, essays or exams and the students learn from each other and from the highly targeted feedback provided ‘live’ on Google Docs within 24 hours of submission at the end of each assessment cycle. The second module, ‘Online Social Networks’ (UOSM2012) is cross-faculty and open to all undergraduates at

Southampton with an optional module choice. However, it follows a more traditional lecturing, workshop, group work and examination pedagogy. It runs at the Southampton campus for a full semester.

Given these differences in context, the researchers selected the integration model most suited to the individual situation. In simple terms, there would be no benefit to integrating the MOOCs as a revision tool into modules which do not have exams, such as MANG2049. In addition, previous observation of the more traditional UOSM2012 module during semester two had indicated that the long Easter break just four weeks before the exam period might be adversely impacting learners' knowledge retention, revision strategies and exam performance. The integration of the Learning in the Network Age and Power of Social Media MOOCs to act as an intervention aimed at reversing some of these adverse effects was therefore developed. Consequently, UOSM2012 was chosen for the Revision model, while the more innovative MANG2049 module was selected for the Full Integration model.

Results

The combination of data collection methods returned both qualitative and quantitative data. Table 2 below indicates the data sources and responses for this research.

Module	Pre-survey	Post-survey	Interviews	Written Reflections & Formal Module Feedback Forms	Grade Data
MANG2049	45 responses	21 responses	Not used	Formal module feedback forms	3 years
UOSM2012	36 responses	0 responses (corrupted data)	3 individuals	47x500 word reflections & 19 formal module feedback forms	3 years

Table 2: Data sources

Combining the data for the two pre-course surveys:

- almost two-thirds of respondents were female (62%),
- 85% of respondents had never participated in a MOOC before,
- 72% had only a vague idea what a MOOC was,
- and 65% had never studied in a blended way before.

Despite this relative lack of awareness and experience of online MOOC learning, nevertheless 71% of respondents identified themselves as somewhere on the Digital Resident side of White and Le Cornu's (2011) Resident-Visitor spectrum. This is perhaps unsurprising given the content and pedagogy of these particular modules, but the findings tend to support the idea that although HE students may be digitally competent (or 'tech-comfy'), they may not have highly developed skills/literacies in using digital technologies for learning purposes.

Student Attitudes to the Integration of MOOCs into on-campus modules

The first set of data to explore is that from UOSM2012, where the Revision model of MOOC integration was employed. Here two MOOCs were used to reinforce module content which had previously been introduced in traditional face-to-face lectures. Unfortunately, due to a technical glitch in the online survey software, the post-survey results from UOSM2012 were corrupted, making it impossible to track changes in student attitudes before and after having participated in MOOC-based blended learning. This therefore required the researchers to draw on the interview, feedback and written data extensively.

The first aspect learners reflected on was the *specific value* which they felt they had received from participating in the MOOC as a revision tool. The comments from across the data were grouped by theme into four broad areas arising from the data analysis as follows:

- General features of being an online course (flexibility and accessibility)
- Enhanced understanding and exploration of content
- Multimedia aspects of the MOOC
- Interaction and participation (global perspectives)

The results can be seen in the chart below.

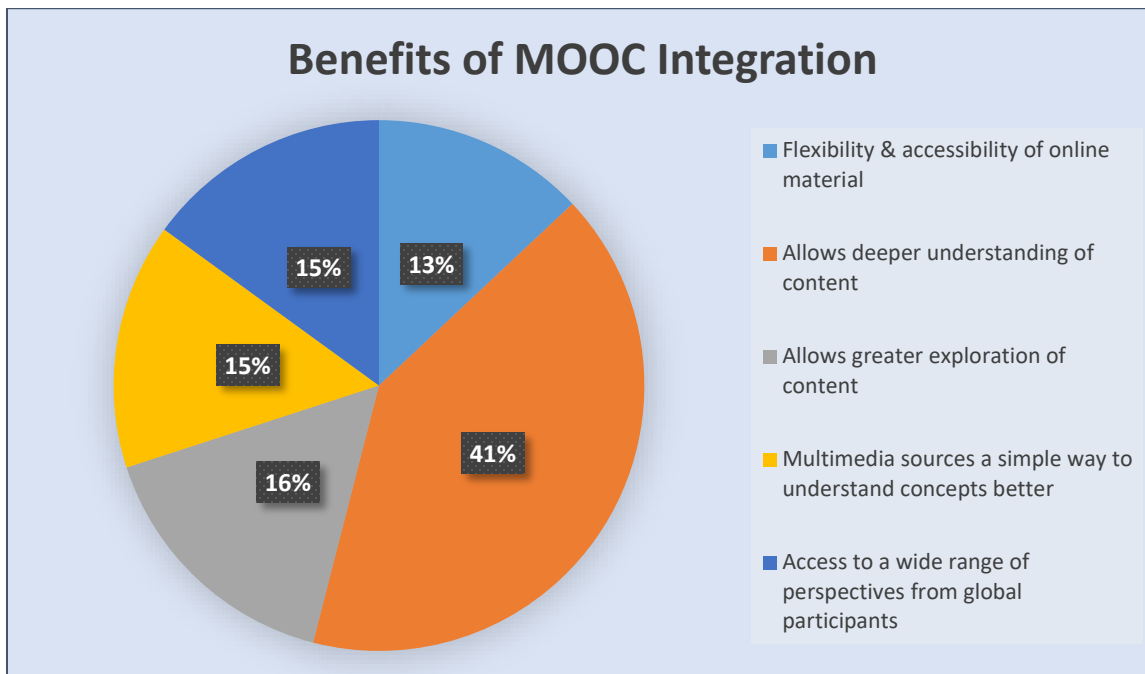


Chart 1: What UOSM2012 students reported as the main value they gained from the integration of the MOOC

The students reported that in addition to the ability to improve their understanding through the use of multimedia resources at any time or place of their choosing, the MOOC enabled them to

explore module content in more detail and thereby deepen their understanding of that content further. Overall, 72% of comments focussed on how the MOOC (and its audio and video) helped students to gain a deeper understanding of the topic and explore more deeply into course content and concepts.

Example comments in this area provides insight when the learners wrote:

1. *"I was able to deepen my understanding in a more connected way"*
2. *"The idea that learning is occurring all around me had not occurred to me before, which is why developing my PLN [Personal Learning Network] had such a profound effect on me".*
3. *"The MOOC was undoubtedly significant in extending my learning network to the digital environment in addition to the lecture theatre"*
4. *"Using a networked learning approach makes everyone a teacher in their own unique fields, with the exchange of these experiences helping the learning of all involved."*

They also valued the range of global perspectives provided by interacting with the non-module participants from around the world. For example, one non-module MOOC participant from a less developed nation discussed the problems of electricity blackouts on their ability to access the Web, an aspect that few of the module students had ever previously considered. This level of storytelling resonated particularly strongly for some students, who may have become increasingly used to 'personal testimony' as an information source (rightly or wrongly!), perhaps due to the increasing prevalence of these types of resources across social media. It seems that access to a networked global community with relevant and interesting ideas and experiences, communicated in a personal and engaging way, can enhance the learning process for the networked student.

In this regard, learners reflected specifically on the value they received from both *reading* the MOOC discussions and *contributing* to them. On reading the discussions, example learner comments included:

1. *"The discussions surprised me with how much they furthered my knowledge. They gave insights and different perspectives that I would not have considered before"*
2. *"The main benefit has been in signposting areas that I need to understand more, and having a huge community on hand to help".*

Concerning contributing to discussions, comments included:

1. *"By engaging with one of the learners who shared his knowledge, he gave me pointers to interesting and relevant contemporary essays – this is something that cannot be incorporated into a printed textbook"*
2. *"I'm not confident asking questions in class but I got a lot of value from contributing to MOOC discussions"*
3. *"Interacting with others to explore the content leads towards a higher quality learning experience."*

These comments may suggest, that for some at least, the social learning approach, mediated through technology, also added value to the learning experience.

However, it is important to note that there were many learners who did not contribute to discussions, citing a preference for lurking, a lack of confidence and a lack of time as the reasons. It was also felt that discussions on the MOOC moved on too rapidly, so late-comers were less likely to receive replies to the comments they did contribute. Some learners also felt that the discussions were often *"fragmented and not always followed through, hence of limited use"* (learner comment). More generally, others reported finding themselves easily distracted, outside their comfort zone, or that it was hard to learn from a screen alone. Indeed, nine percent of learners explicitly stated that they felt a mix of online and offline was best.

As a further reference point, the anonymous end-of-module feedback forms provide additional data. Nineteen learners (41%) completed the feedback forms, with twenty-five percent reporting the MOOCs as the best feature of the module. One example learner commented, *"The MOOC's were extremely helpful in developing knowledge from lectures and good to use when revising"*. Taken as percentage of the total cohort, a little over eleven percent clearly found the MOOCs of considerable value to their learning.

However, an almost equal percentage of feedback respondents (23%) felt that how to use the MOOCs effectively had not been made clear enough and that they had not taken the maximum value from them. An example comment along these lines was, *"The use of the MOOC was not made that clear and the lectures seemed to cover most of what was online"*. It may be the case that these learners failed to take advantage of the four face-to-face workshop support sessions which were an important part of the intervention design, nevertheless, for this eleven percent of the total cohort the integration of the MOOCs did not add value. Future interventions could be improved by developing more effective support programmes that reach out to all.

Turning to the survey results for MANG2049, firstly it is important to remember that only a single MOOC was integrated according to the Full Integration model. Secondly, the survey did not suffer from any technical issues and hence it was possible to examine the change in student attitude towards the integration of the MOOC from before and after the intervention. There was a 74% response rate to the pre-survey and a 34% response rate for the post-survey (as percentage of total cohort).

Prior to the module only two students had participated on a MOOC before, so it is unsurprising that there was a significant number of 'neutral/no opinion' responses in the pre-survey. However, it is the direction of travel from that point which matters – towards the positive or the negative side of the question. In most cases there was a significant shift to the positive, suggesting that MOOC integration into on-campus modules is broadly well-received by students.

Students were asked to respond to a series of statements, as displayed in the charts below (Charts 2 – 7).

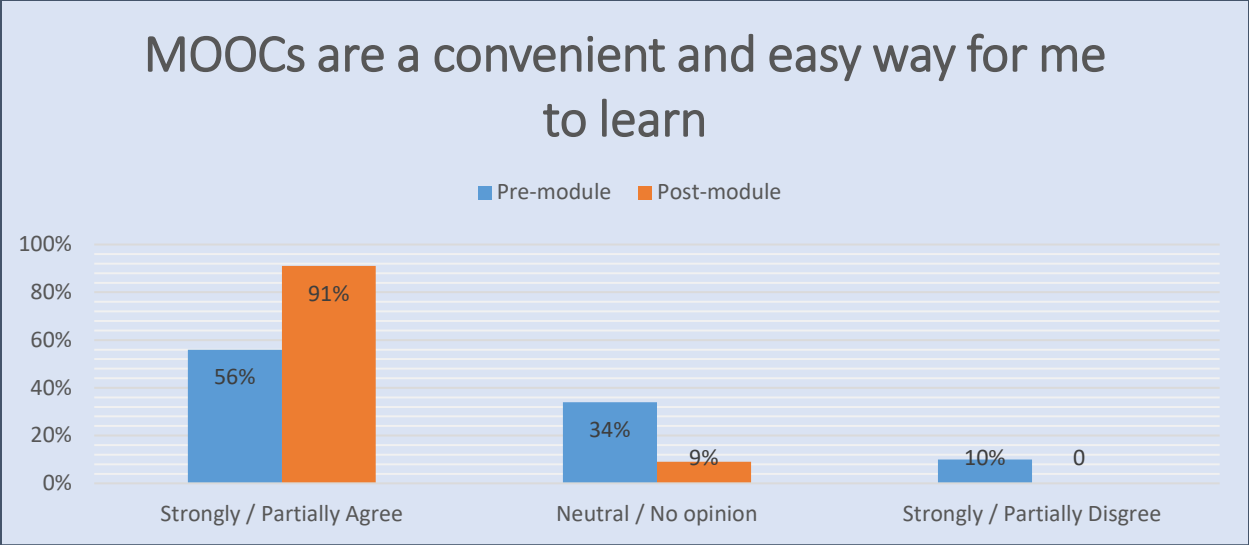


Chart 2: Statement 1

This result mirrors that from UOSM2012, with students valuing the ease and flexibility provided by online learning.

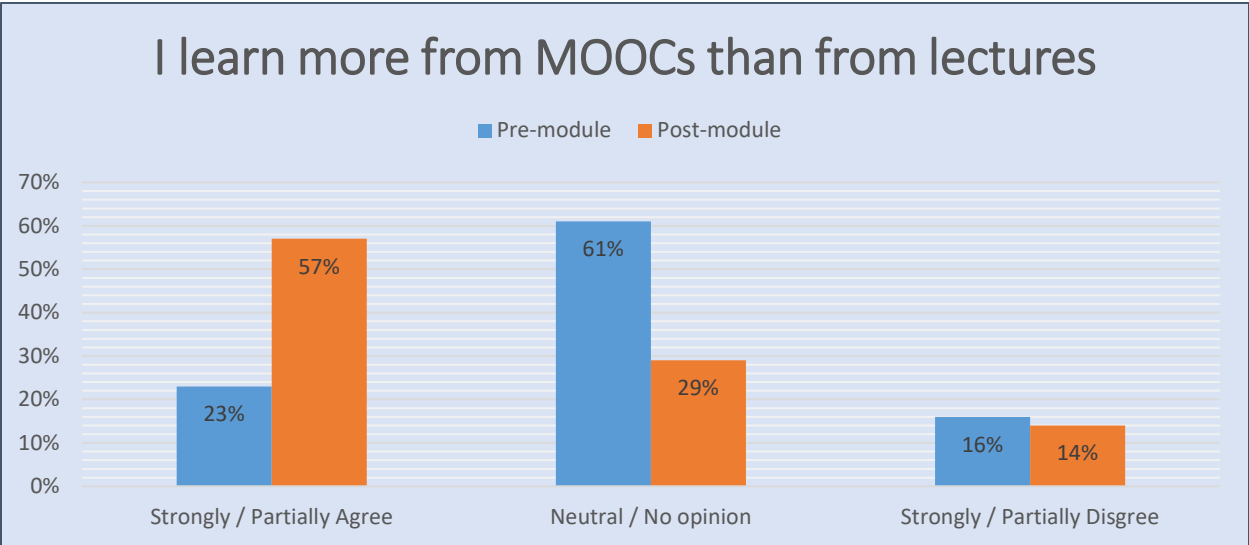


Chart 3: Statement 2

This result is particularly interesting, as more than half the students felt that they learn more from MOOCs than they do from lectures, while fewer than one in seven students feel that they learn more from lectures than from MOOCs. Furthermore, the percentage of students who valued the MOOC as a more effective learning approach than the lecture more than doubled after the students had experienced MOOC participation. This raises some very interesting questions concerning the relevance of traditional HE teaching & learning practices to the networked student of today and adds considerable weight to the case for integrating MOOCs into on-campus modules.

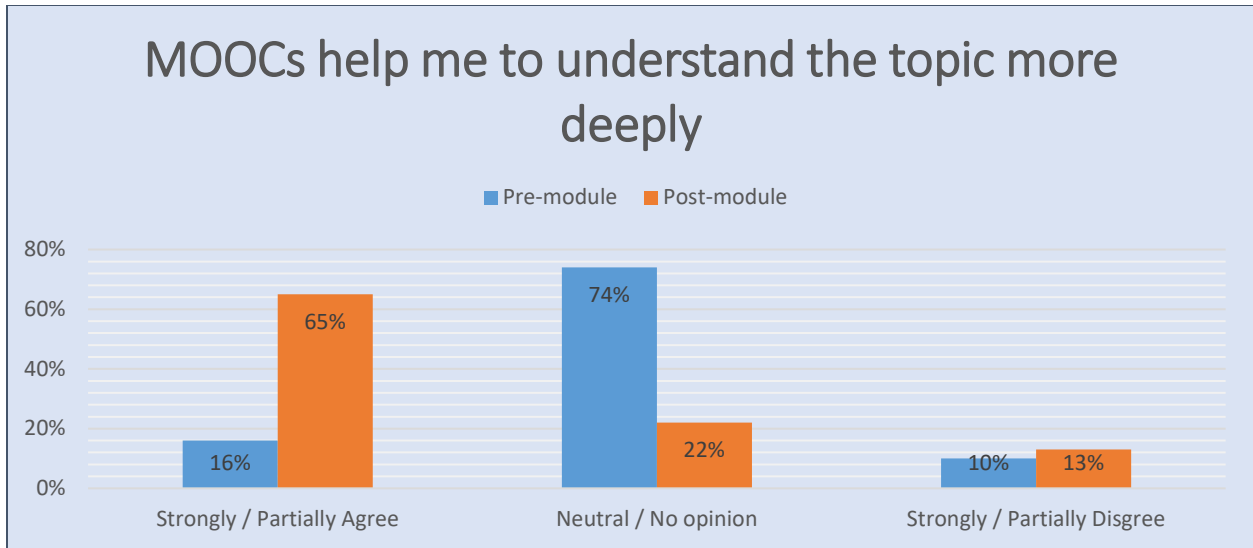


Chart 4: Statement 3

Again, mirroring results from USM2012, this finding indicates that one of the most important benefits that integrating a MOOC into an on-campus module can have is that of deepening student's understanding of the module content. In simple terms, their learning is improved. Clearly, the students themselves value this, with a significant shift towards the positive after the intervention.

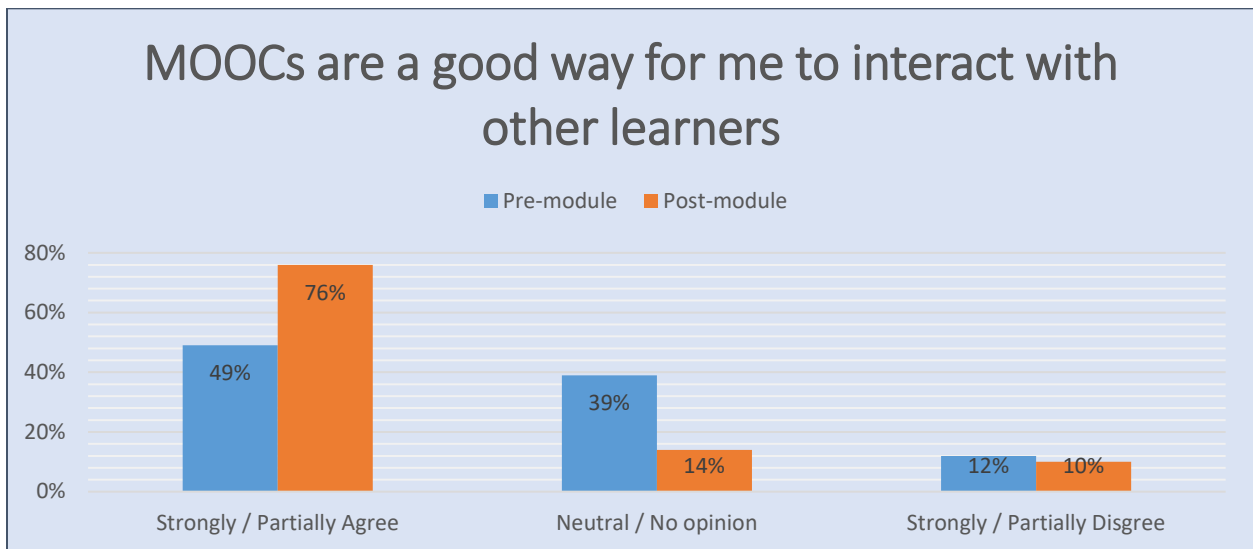


Chart 5: Statement 4

Again, mirroring findings from UOSM2012, students appear to value the interaction opportunities a MOOC provides, although it is not clear in this case whether that is with the wider global participants or with others from the same module. In either case however, the MOOC provides an avenue for improved interaction – a key feature of social, networked learning.

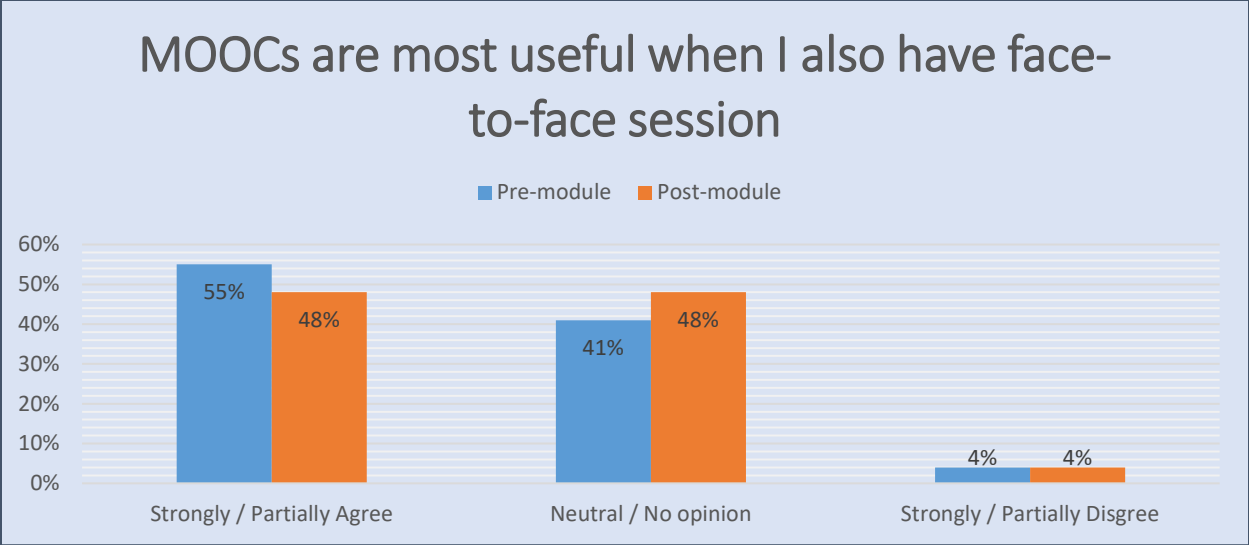


Chart 6: Statement 5

This result adds weight to the statements from the NMC HE Report (Becker et. al., 2017) concerning the vital importance of developing and delivering blended learning which makes full use of online (and mobile) opportunities alongside offline provision. Given that this particular module had no co-located face-to-face elements (it did have daily Google Hangouts), it is also a reminder that online learning alone is not sufficient.

What is also noteworthy here is that the percentage of students who strongly or partially agreed with the statement fell after the intervention, suggesting that traditional face-to-face interactions reduce in importance after MOOC participation, further confirming the increasing (lack of) value students place on lectures and other traditional face-to-face interactions.

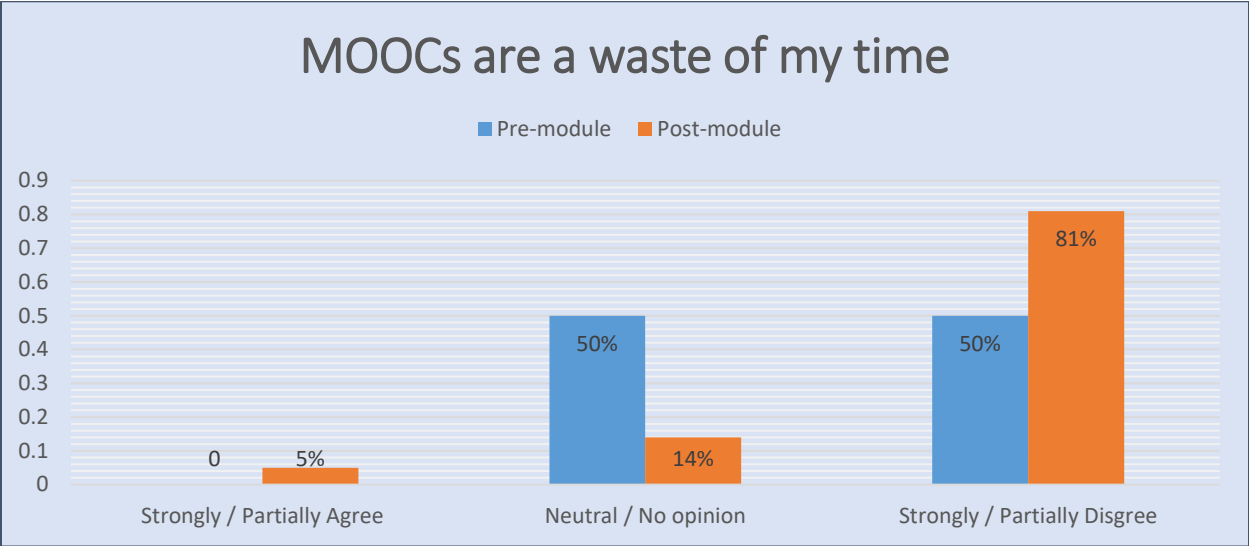


Chart 7: Statement 6

There was, again, another shift towards those who did not consider the MOOC a waste of time after having participated in it. However, it is important to note that post intervention 5% - 14% of the students did NOT consider the integration of and participation in the MOOC to be of value to their learning processes. This reflects the understanding gained from the earlier discussions concerning digital differences and digital literacies levels and indicates that even with a considered programme of support not all students will either benefit from or value a non-traditional approach to HE teaching & learning.

In summary, student attitudes towards the integration of a MOOC, regardless of the model of integration, are broadly positive. There was a shift from a neutral or negative attitude towards a positive one once students had been exposed to the MOOC, with a positive shift in attitude evident in all categories (a 31% shift to the positive on average). This is because students value the MOOC as a convenient, flexible and accessible way to study where and when they choose. Most importantly of all though, the students report that the primary value of an integrated MOOC is its impact on the depth of their understanding of the module content. This is due to a combination of the use of multimedia resources, the increased global and local opportunities to interact with a community of interested others, and the fact that it is not a lecture (i.e. it is not the passive absorption of information from an 'expert', but an active, self-directed process over which they have some control). However, there remains a small number of students who, despite programmes of support, do not respond positively to MOOC integration, instead considering it to have little or no benefit to their learning or to be a waste of time.

Overall, the findings suggest that from the student perspective the integration of MOOCs reflects the conceptualisation of learning detailed earlier in this chapter, in that integrated MOOCs:

- enable individual learning (they allow flexible, accessible, self-directed study),
- reflect the Socio-technical norms (they enable increased opportunity for diverse interactions with human and non-human others)
- are networked (they empower the identification of connections/patterns which deepen understanding and the growth of Personal Learning Networks).

Consequently, the integration of MOOCs into on-campus modules appears to be a suitable response to the needs and preferences of the networked student and to what it means to learn in the modern HE context.

The impact of integrating MOOCs into on-campus modules on student achievement

Clearly, the students themselves consider the integration of a MOOC to be of value to their learning, no matter the integration model and specific context of the module. However, it is also important to try to corroborate this impression with data concerning student achievement. Essentially, regardless of student attitude, does the integration of the MOOCs, as either a revision tool or as a primary module resource, translate into better module results?

To explore this further, a comparison of the module results was made for the previous three years. Clearly caution must be exercised here as a whole host of other mitigating factors may also have had an effect on module grades, not least of which are:

- the different student cohorts involved,
- improved teacher experience (another year of delivering the module),
- different exam questions year-on-year,
- different marking teams year-on-year,
- minor differences in module content.

As a result, as with the attitudinal findings, at best this analysis can only provide an indication of the impact of integrating MOOCs into on-campus modules. No definitive causal significance can be attached to the changes having resulted from the MOOC intervention.

The most notable change to module results were observed in the UOSM2012 module where the MOOCs were used as a revision tool. After the intervention (during the 2017 run), the percentage of learners achieving a first doubled when compared with the previous two years (up from 11% to 22%), meaning that nearly a quarter of the students achieved the maximum grade. In addition, there was a five percent increase in learners gaining a 2,i and a significant decrease of thirteen percent in the number gaining a 2,ii. This led to an increase of three percent in the module average grade – which equates to the movement of the module average grade upwards from a 2,ii to a 2,i - an entire grade band (see chart 8).

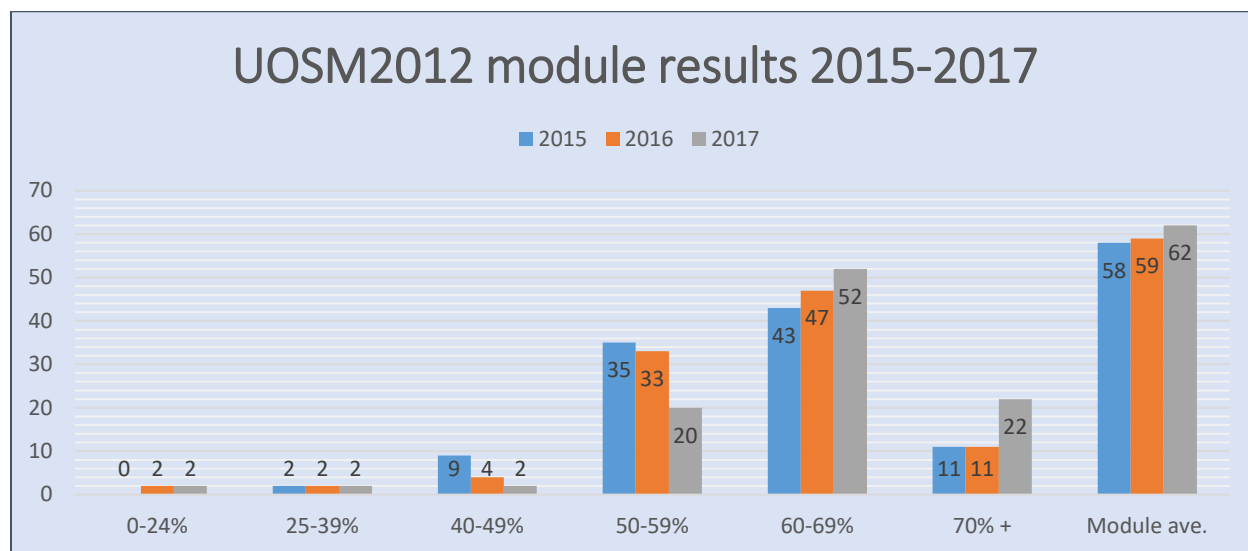


Chart 8: Comparison of module results for UOSM2012 from 2015 to 2017 (percentages).

With almost a quarter of the UOSM2012 2017 cohort achieving the maximum possible grade, (while always bearing in mind the multiple variables which might have had an effect on this), perhaps the student perceptions of the benefits that the MOOCs brought to the depth of their understanding of the module content *is* reflected in their improved assignment and exam performance. The same may also be said to apply, (with the same caveats), to the reduction in 2,i's and thirds, and the jump in module average. The integration of MOOCs as a revision tool

may, cautiously, be said to have a positive effect not only on student perceptions of their learning, but also on their actual module grades.

However, the picture becomes somewhat more blurred when conducting the same results comparison for MANG2049, as can be seen in chart 9 below.

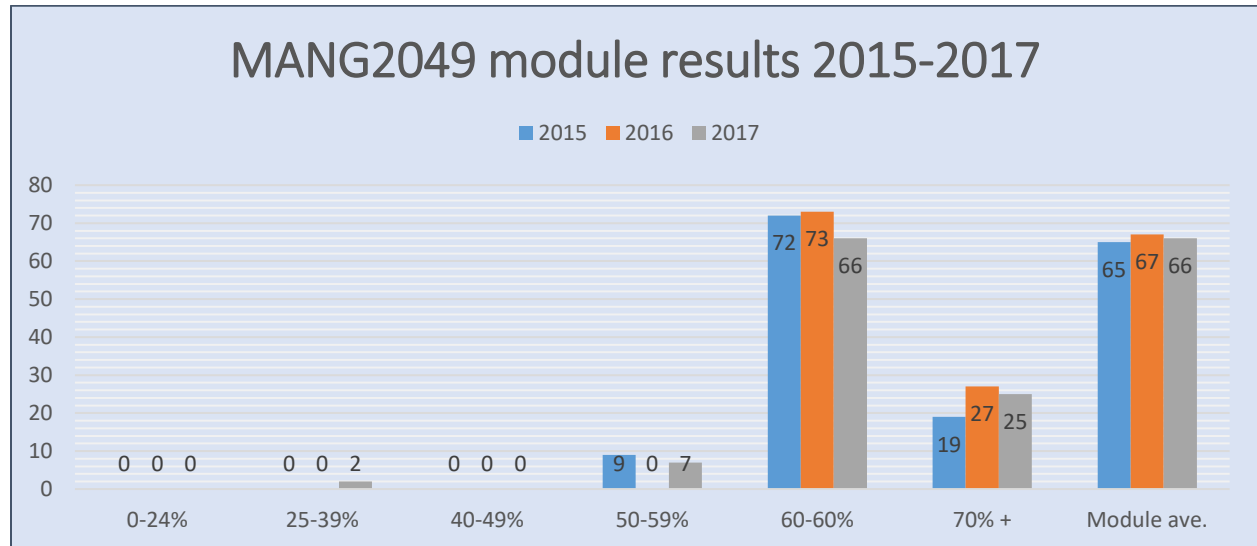


Chart 9: Comparison of module results for MANG2049 from 2015 to 2017 (percentages).

In this case, there was an decrease in the percentage of students achieving a first or a 2,i, and an increase in those with a 2,ii and a fail compared with the previous year. This led to a slight decrease in the module grade average of one percent compared with the previous year. As a result of this, frankly, disappointing finding, the researchers used the formal end-of-module feedback forms to investigate further. A brief analysis thereof seemed to suggest that a possible reason for this reduction in student achievement was that in an already very intense three week module, with submission deadlines every three to four days, students felt that there was not enough time to engage with the MOOC effectively. However, as the MOOC was a fully integrated part of the module, this suggests that students did not realise how to engage in a way that would be of use to them, and points to failings in the intervention design and the amount and nature of the support provided for students in this specific Singaporean context.

Nevertheless, in summary, the data concerning the effectiveness of the intervention on student achievement indicates a somewhat mixed picture. The impact seems to be affected by both the specific context of the module and the integration model employed. At this stage, although both interventions were perceived as beneficial by students, the Revision model appears to have a greater impact on module grades than does the Full Integration model. However, these findings must be treated with caution, as a wide range of other factors may have affected the module grades.

Conclusion

It is perhaps not surprising that the integration of the MOOCs into the modules produced mixed results. For the majority of students the MOOC provided network development and social learning opportunities that were highly valued, adding to depth of their understanding of module content and providing an interesting range of perspectives and people for them to interact with and learn from. Indeed, more than half the students were of the opinion that they learnt more from a MOOC than from traditional lectures, due to the MOOCs flexibility, multimedia content and interaction opportunities. This is reflected in the fact that when MOOCs are used to reinforce learning previously provided through traditional lectures (the Revision model) they can have a positive effect on module achievement, resulting in an increase in top marks and grade averages and a decrease in low marks.

However, for other students it was unclear to them how the MOOCs should be used or what learning value it would bring. These students felt that MOOC participation was something outside their comfort zone, an added pressure in an already intensive module, or just a waste of their time. The type and effectiveness of the support provided to mitigate against pre-existing digital differences in online behaviour, motivation and digital literacies level is likely to be key to effectively engaging these students and reversing these attitudes. Furthermore, it may also be the case that MOOC integration is not suited to all module contexts and if the wrong integration model is applied, or insufficient support provided, the impact on module achievement may be adversely affected.

It remains the case that more learner familiarity with Socio-technical, Connectivist learning centred on the development of Personal Learning Networks, digital literacies and network skills would be of benefit to all. However, the integration of MOOCs into university modules is not a one-size-fits-all solution to improving achievement and student satisfaction, rather the right MOOC must be deployed in the right way for the right module and cohort. It is to be hoped that this research will contribute to the discussions concerning the effectiveness of the adoption of MOOCs for internal purposes, and more generally, the adoption of an individual, socio-technical, networked approach to HE teaching and learning. In time, continued research and further discussions might enable HEIs to maximise their use of MOOCs by integrating them where appropriate throughout the curriculum as a gateway to providing innovative, connected and effective HE teaching and learning which responds to the expectations and practices of the networked student.

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