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‘Not just men in grey suits’: an Accounting, Finance and Business Massive Open Online Course

Alice Shepherd
Leeds University Business School,
University of Leeds, UK
a.k.shepherd@leeds.ac.uk

Abstract

In 2014, ICAEW asked the University of Leeds (UoL) to co-develop an accounting and finance massive open online course (MOOC), ‘The Importance of Money in Business’. The target audience was pre-university and undergraduate students. This article explains the development process, structure and pedagogies, and analyses learner characteristics, behaviour and feedback using a range of data. It builds on prior literature and a research programme at UoL (Elston and Morris, 2015; Morris, Hotchkiss & Swinnerton, 2015; Swinnerton, Hotchkiss, Morris & Pickering, 2017a; Swinnerton, Hotchkiss & Morris, 2017b), which has developed and delivered more than 30 FutureLearn MOOCs across a range of subjects. The development process took 15 months to develop a four week course, and included a range of resources and activities including animated video, interactive exercises and quizzes. Over 18,000 people enrolled on two runs of the course. This article contributes to the literature by providing insights into the development and delivery of the course, its learners, their preferences and behaviours while taking the course, which will assist others embarking on MOOC or online learning development.

Keywords: online learning, MOOC, digital learning, business education

Introduction

In 2014, UoL was approached by ICAEW (the Institute of Chartered Accountants in England and Wales), a professional accountancy body, proposing co-development of a MOOC. ICAEW wanted a free course, aimed primarily at pre-university and

undergraduate students, with a secondary audience of ICAEW students (graduate or non-graduate trainee accountants typically working full-time). ICAEW had educational and marketing objectives. They wanted to break down myths about the dull, technical world of finance and accounting (hence the article title), showcase the variety of careers, how important finance is for business success and further study routes. They felt developing a MOOC would differentiate them from other professional bodies pursuing conventional marketing campaigns.

Since 2013, academics at UoL have worked with its Digital Education Service (DES) to develop and deliver more than 30 FutureLearn MOOCs on subjects ranging from anatomy to physical theatre (FutureLearn, 2017). FutureLearn has over seven million users and over 100 international partners (FutureLearn, 2018). Recently, the launch of the first UoL Coursera MOOC (University of Leeds, 2018) was announced. In this article, a literature review is followed by explanations of course development and delivery. Results address the following: who were the learners, how did they engage, and what did they think of it? The penultimate section discusses limitations and future research directions. The conclusions section reflects on the findings. Finally, suggestions for other MOOC course teams are made.

Literature review

MOOCs are a relatively recent educational phenomenon, with the first one being developed in 2008 (Morris et al., 2015; Swinnerton et al., 2017a), as an evolution of the open educational resources movement. MOOCs did not start to receive widespread attention until 2012 and 2013, with suggestions they would revolutionise education and replace universities (Johnson & Adams Becker, 2015). Alongside such expansive claims, there has been a continuing dialogue in the literature about organisations' rationales for developing MOOCs, and how they may become commercially sustainable. BIS (2013) and Burd, Smith and Reisman (2015) suggest that certification and assessment could offer revenue streams. Furthermore, these authors suggest developing MOOCs could improve universities' brand recognition, allowing them to compete more effectively for students in a crowded marketplace. Rhoads, Camacho, Toven-Lindsey and Lozano (2015) identify additional institutional motivations ranging

from giving access to star professors to a broader range of students, to addressing funding shortages by using other institutions' MOOCs to supplement learning resources. Ferguson and Sharples (2014) and Hew and Cheung (2014) suggest that academics may be altruistically motivated to develop a MOOC. Hew and Cheung (2014) suggest some more instrumental motivations such as developing academics' educational practice, enhancing personal reputation or promotion cases.

Considering MOOC development processes and pedagogic mixes, the first MOOC used a range of online tools including social media platforms, and the aim was to allow learners to share and co-construct knowledge in a distributed learner-organised community (Ferguson & Clow, 2015). The realisation that this connectivist (c)MOOC approach would be difficult to scale to many thousands of learners (Rhoads et al., 2015) led to the development of xMOOCs (the 'x' standing for extension) (Ferguson & Clow, 2015) using more instructivist pedagogies. xMOOCs developed on US platforms such as Coursera, Udacity and EdX comprised video lectures, readings, quizzes and online discussions (Morris et al., 2015). However, the xMOOC-cMOOC dichotomy has been criticised as an over-simplification of the range of design approaches taken (Bayne & Ross, 2015; Ross, Sinclair, Knox, Bayne & Macleod, 2014).

Stokes, Towers, Jinks and Symington (2015) describe course development as iterative. Bayne and Ross (2015) suggest that pedagogy is emergent, not solely bound by platform affordances, and that 'each MOOC is profoundly shaped by its designers, teachers, platform and participants' (p.25). Such iterative development processes are costly in time and monetary terms. Burd et al. (2015) acknowledge the financial investment involved in MOOC development, estimating average costs ranging from $15-60k, consistent with Haywood and Macleod's (2015) estimates of the University of Edinburgh's costs of $50k. BIS (2013) suggest a 'typical' MOOC involves around 100 hours of development and 8-10 hours of staff facilitation, raising concerns about managing the workload alongside existing staff responsibilities. Bayne and Ross (2014) suggest around 30 days of academic staff time is needed to develop a 5-6 week MOOC.

Several authors have suggested MOOC design 'best practices'. Klobas, Mackintosh and Murphy (2015) suggest that course teams need to consider purpose and target audience, timing, pacing and effort, structure, content, interaction and assessment

methods. Hayes (2015) suggests that problem-centred, real world learning approaches should be used. She recommends that learners should receive regular feedback on their progress and attainment, and there should be personalised learning pathways for different learners, acknowledging that these practices could apply to all types of courses. Ferguson, Coughlan and Herodotou (2016) analysed existing MOOC features, emphasising the importance of signposting so that learners can engage with parts of the course in which they are most interested. Discussions or other bridges may need to be set up for late joiners.

To date, there has been relatively little interest in MOOCs within accounting education. Freeman and Hancock (2013) suggest that MOOCs should prompt accounting educators to consider what can be accomplished effectively online to make best use of classroom time. They predict professional body involvement, suggesting that they might accredit existing courses and develop MOOCs aimed at secondary school pupils, to attract them to accounting careers. They also suggest using introductory MOOCs for non-finance staff professional development. Furthermore, Freeman and Hancock (2013) suggest that rapid educator responses to learners' questions, media-rich explanations and curated materials for further reading should be used to encourage learners to persist, thereby acknowledging perceptions in the accounting education community that learners can find the technical complexity associated with learning introductory accounting discouraging (Lucas & Mladenovic, 2007).

There has been considerable attention paid in the literature to identifying characteristics of MOOC learners and their motivations for taking a MOOC. Baturay (2015) develops a MOOC learner typology: prospective university students, current university students, hobby learners, vocational learners and teachers/ researchers. Hew and Cheung (2014) refer to a range of reasons for enrolment including curiosity, as a hobby or because of a specific topic interest (academic or work-related). Macleod, Haywood, Woodgate and Alkhatnai (2015) and Young (2013) report on the phenomenon of serial MOOC learners. Overall, 58% of learners on FutureLearn are female, and more than 70% already have a degree (Morris et al., 2015). More than 50% of learners are working. 13% are over 55 years old. Learner characteristics on other platforms are similar (Macleod et al., 2015; Morris et al., 2015), although there are large variations between courses. Gender balance appears to be somewhat related to topic, with the

University of Edinburgh's MOOCs ranging from 15% to 90% female, depending on subject (Macleod et al., 2015). This diversity leads Morris et al. (2015) to conclude that there is no typical MOOC learner. Gore (2018), in a large-scale survey of FutureLearn MOOC learners, found the most common reason for enrolling (87% of the 120,842 responses) was personal interest rather than reasons related to specific educational goals or professional development.

Since expansive claims about the potential revolutionary effect of MOOCs were made, media attention has shifted towards a narrative that MOOCs have failed to meet their potential. This narrative often focuses on low completion rates (Lederman, 2019). Morris et al. (2015) report that typically 5-12% of those who start a MOOC finish it. Jordan (2017) maintains a dynamic report of completion rates – suggesting a 'typical' MOOC has 25,000 learners, and a 15% completion rate. Clow (2013) identifies a 'funnel of participation' with the number aware of a course, those registering, those participating and those completing getting progressively smaller. The extent to which low completion rates represent a problem or something to be expected when learners are free to sample a course and withdraw without penalty and considering that they may never have aimed to actually complete the course in the first place, remains a contested issue. Gore (2018) suggests that whether a learner visited a course element and how frequently, as well as whether and how much they commented on discussion forums during the course may be better proxy measures for learner engagement with a MOOC and analysing these aspects of learner behaviour may provide more insights for course designers as to learning designs that encourage or discourage engagement from MOOC learners.

Considering commenting behaviour, Swinnerton et al. (2017b), investigating learner commenting on nine UoL MOOCs, found that 32% of learners made one or more comments, similar to the 36% of learners reported by Sharples (2016) as engaging in social interaction – making a comment, reading a comment, following a contributor or liking a comment. Tubman, Oztok and Benachour (2016) analysed six FutureLearn MOOCs, identifying that no course had more than nine instances of discussions longer than eleven comments. They take conversation length as a proxy for depth and suggest educators should guide learners about expectations for deeper learning conversations on the forums.

Interview studies have explored learner behaviour in more depth. Hew and Cheung (2014) report themes from the literature such as learner disappointment with the lack of depth in discussions, slow responses from educators, and ambiguous instructions or expectations for assessments. Learners found lack of time and prior knowledge challenging on some courses, and were frustrated with having to scroll through off-topic posts on discussion forums to find relevant comments. Milligan and Littlejohn's (2014) interviewees discussed feeling unsupported. Young (2013) interviewed US-based learners who had completed multiple MOOCs, and gives the following advice: courses should be clear and well-organised, learners remember the educators rather than the institution, text is important to learners as well as videos because few videos are searchable, and learners can forgive educators who do not come across well on video, as long as they are enthusiastic.

Hew (2016) draws on observation of learner behaviour and course reviews for three MOOCs. Course features perceived by learners as engaging were: problem-centred learning with clear explanations, passionate, accessible educators, peer-peer interaction, opportunities for learners to apply learning actively and course resources that were matched to learner needs. Considering links between learner engagement and feedback on MOOCs with course design, Gore (2018) analyses multiple deliveries of 19 FutureLearn MOOCs developed by the Open University, spanning a range of subjects including business studies. The aggregated learner behaviour data from these MOOCs shows that learners were more likely to comment on course elements which contained content delivered by the course team (e.g. articles, videos) than on elements which aimed to elicit learner discussion. Course elements with specific questions in their titles also prompted higher levels of learner comments.

To summarise dimensions that MOOC development teams should prioritise in the development process, Gore (2018) proposes that four overall factors can affect learner engagement with a MOOC: platform (which MOOC platform is used for delivery), population (demographic characteristics of learners), presentation (timing of course run) and pedagogy (learning design). If all four factors are optimal, this would encourage learner engagement with a run of a MOOC.

Course development

The development phase for this MOOC lasted fifteen months. As described by Stokes et al. (2015), the process was collaborative and iterative. The course team met weekly and communicated daily with the DES, who were following an agile project management approach used on previous UoL MOOCs (Elston & Morris, 2015). There were two major planning and review meetings with ICAEW. The time commitment and costs were in line with the estimates in the literature review.

It was decided that the course length would be four weeks. Most FutureLearn MOOCs are between three and five weeks long. The outline time to be spent by learners each week was set at four hours. Too little, and we felt that learners would struggle to engage with technical content. Too much would discourage enrolment. We developed a course outline (see Figure 1), and decided to name the course 'The importance of money in business'. This title was chosen to avoid technical references which might discourage enrolment, and to emphasise money's central role in business. We aimed for a course level suitable for the target audience, but also made efforts not to exclude non-target audience learners in our scripting and design choices.

Figure 1. Course outline. FutureLearn courses are organised into weeks and activities. Activities are split into steps.

ICAEW

The importance of MONEY IN BUSINESS

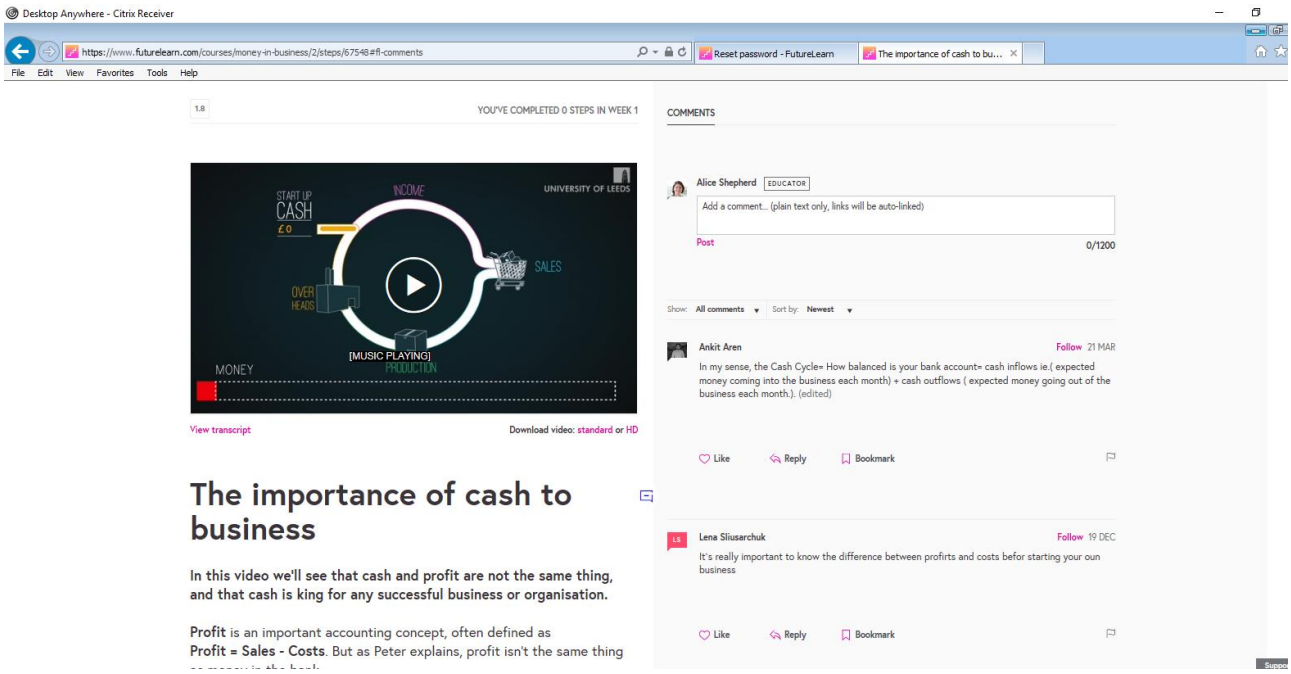
UNIVERSITY OF LEEDS

		Activity 1	Activity 2	Activity 3	Activity 4
Week 1	What makes a business successful?	Profiling the successful business Business plans and 4Ps	Cash is king Cash vs profit and controlling cash	The role of financial management Managing the cash cycle	What does it take? Key skills: teamwork and communication
Week 2	Growing a business	Making choices in business Analysing business decisions and SWOT analysis	Strategies for growth Organic and by acquisition	Growing a business Assets and capital, financing growth, return on investment: payback	What does it take? Key skills: decision-making
Week 3	Running the business	The toolkit The finance team, financial data, financial lifecycle of a business	Planning and control Budgets, forecasts, variance analysis	Making decisions and monitoring performance Monitoring performance and simple ratio analysis	What does it take? Key skills: problem-solving and adding value
Week 4	Communicating business success	Financial performance and measuring success Businesses and not for profit entities	Reporting success Stakeholders, understanding financial reports	What does it take? Key skills: ethics and technical competence	

The structure followed the 'arc' of a business from inception through growth, management and communication of performance. Every week, one activity entitled 'What does it take?' focused on the skills necessary to be a successful professional, and encouraged learners to reflect on their current skill levels and plan how they were going to address gaps. Skills highlighted were based on the ICAEW professional development ladders (ICAEW, 2013).

The FutureLearn platform has a social design (Morris et al., 2015) based on Laurillard's conversational framework (2002). This approach suggests that teachers and learners should work cooperatively, and that learner-learner interactions have an important role in learning, in conjunction with teacher-learner interactions, in an "iterative dialogue" (Laurillard, 2002, p.77). Therefore, each step has an accompanying discussion forum, enabling learners and course team members to initiate and respond to discussions. Social learning features had recently been introduced to the platform when we started the course development, allowing participants to 'like' individual comments made by other learners and follow other learners and members of the course team.

Figure 2. Course appearance. Course content is on the left and the discussion forum is on the right



The platform allows text, video and audio resources with accompanying subtitling and transcripts for accessibility (Swinnerton et al., 2017a). We used educator videos to introduce technical concepts. Most videos were six minutes or shorter (Guo, Kim & Rubin, 2014). Animated images and key words were added by the DES after filming, to help learners understand and remember the principal concepts (Bloom, Englehart, Furst, Hill & Krathwohl, 1956). Videos of case study interviewees discussing aspects of their roles relevant to each week's content were also used, to help learners understand real-life applications of the concepts, in the interviewees' own industry contexts and roles (Bloom et al., 1956). Case study interviewees worked in sectors as diverse as retail, food and drink and an international charity and included senior figures such as the President of ICAEW, a life peer chartered accountant in the House of Lords, the UoL Vice Chancellor and the chair of a National Health Service Trust.

For this course, the DES authored four interactive exercises using a non-platform HTML-based tool and linked to them from the relevant step (Elston & Morris, 2015). These provided animation with small amounts of text, asked learners to complete an answer (e.g. by typing in a number) and then provided feedback on that answer. The questions allowed two attempts before allowing the learner to progress. The exercises were on the most technical topics: cash vs profit, the balance sheet, variance analysis and calculating financial ratios. This pedagogic choice was designed to allow learners to practise applying technical concepts to authentic examples (Hayes, 2015), and to give them opportunities to analyse financial information in a structured way (Bloom et al., 1956).

Each week contained a quiz consisting of five multiple choice questions, with instant feedback provided for correct and incorrect answers. These again allowed learners to practise applying technical concepts and analysing information (Bloom et al., 1956). Incorrect answer feedback routed learners back to the relevant step where each concept being tested had been covered. There was a longer end-of-course quiz, and learners had the option to register (for a modest fee) and take a longer online computer-based assessment which was certificated by ICAEW, FutureLearn and UoL, and provided a taster of ICAEW's Certificate in Finance, Accounting and Business (CFAB), the entry level chartered accountancy qualification.

Course delivery

The first run was in September/October 2015. This was ICAEW's preferred timing to engage learners early in the academic year. FutureLearn has three course team roles: educators, who are "the visible face(s) of the course" (Bayne & Ross, 2015, p.38), hosts, who provide academic input by responding to learners' comments on discussion forums, and mentors, who facilitate discussions. On this course, the author and the Dean of the Business School were the two educators, three other subject matter experts were hosts, and the DES and ICAEW staff were mentors. During the course run, educators, hosts and mentors rotated in half day shifts monitoring and facilitating the online discussions.

The second run was in April 2016 to capture further target audience learners around the Easter holidays. Virtually no changes were made to the course between the first and second run, beyond small typographical corrections to course text. The second run was supported by the same course team as the first run, allowing direct comparison between the two runs.

Results

FutureLearn collects an anonymised dataset for each MOOC. At registration, users are advised that data collected on the platform may be used for research purposes. Approval for this study was obtained from the UoL Research Ethics Committee.

Overview

FutureLearn classifies learners into categories – see table 1.

Table 1. FutureLearn categories

Category	Meaning
Joiners	Registered on a course
Learners	Completes least one step
Active learners	Completes at least two steps
Returning learners	Completes the first week and returns to the second week but does not complete course
Social learners	Makes or likes at least one comment posted by someone else
Fully participating learners	Completes at least 50% of steps and all quizzes (eligible to purchase a statement of participation)

The mix of learners between categories was similar for both runs – table 2. However, the proportion of joiners who became learners was lower than for other UoL MOOCs. The proportion of returning learners was higher than for other Leeds MOOCs, and the proportion of fully participating learners lower. One possible reason for the relatively low number of learners on the second run compared with the first was that the second run took place only six months after the first, so there was limited opportunity to market the course to those who had not done it the first time.

Table 2. Overview statistics on number of learners by category. A learner can appear in more than one category (active/returning/social/fully participating)

Category	First run	Second run	UoL MOOCs‡
Joiners	12,897	5,533	27,859
Learners	5,533 (43%)*	2,171 (39%)*	16,365 (59%)*
Active learners	4,217 (76%)**	1,617 (74%)**	-
Returning learners	2,058 (37%)**	737 (34%)**	639 (27%)**
Social learners	1,318 (24%)**	472 (22%)**	-
Fully participating learners	1,048 (19%)**	383 (18%)**	532 (23%)**

‡ Aggregated statistics for five UoL MOOCs delivered in 2015 (physical theatre, anatomy, sustainability, innovation and enterprise) according to Morris et al. (2015).

*Percentage of joiners ** Percentage of learners

Learner characteristics

The pre-course survey contains a standard question set for all UoL MOOCs and a link to it is provided when learners register. For the first run, there were 1,052 responses (8% of joiners). For the second run, there were 168 responses (3% of joiners). The enrolment data provided by FutureLearn also contain some demographic information about each joiner (first run, n=12,862, second run, n=5,515). These figures differ slightly from those in Table 2 because of the exclusion of course team members from the enrolment figures. The enrolment data includes a smaller subset of learner characteristics than the pre-course survey. Where available, analysis from the enrolment data (for known responses only) has been presented rather than pre-course survey responses. This is because, although responding to the pre-course survey and providing demographic data at enrolment were both optional, it is possible to link an individual's enrolment data to activity on the course, whereas this is not possible with the pre-course survey responses, which are anonymous.

Learner aims

Table 3 shows responses to the question 'What do you hope to get out of this course?' Multiple selections were permitted. For both runs, the response patterns were similar. The most common aims were to learn new things and improve career prospects. This was in line with the course aims and design, vocational focus and skills thread, which were highlighted in the course trailer video, the main source of information for potential joiners before the course started. The popularity of the reason to 'learn new things' is consistent with the popularity of personal interest in responses to Gore's (2018) much larger-scale survey. However, as might be expected given the subject matter of this MOOC, the proportion of learners responding that they wanted to take this course to improve their career prospects was higher than the average proportion across the various MOOCs in Gore's sample (33% of those survey responses cited professional development as an aim).

Table 3. Learner aims

	Pre-course survey	
Aim	**First run % of responses**	**Second run % of responses**
Learn new things	77	77
Learn more flexibly around my other commitments	29	32
Try out learning online	35	38
Interact with other people	20	37
Try out FutureLearn or MOOCs in general	23	21
Add a fresh perspective to my current work	38	38
Improve my career prospects	67	74
Find out more about the university	10	10
Prepare for further studies	36	45
Supplement my existing studies	37	41
No expectations	1	1

Location

Countries with more than ten respondents have been reported – for the second run, 67% of the respondents lived in the UK and there were no other countries with more than ten respondents, therefore the responses have not been broken down. The proportion of UK learners on the first run was very similar to the benchmark of aggregate data from five other UoL MOOCs (Morris et al., 2015), in which 56% of learners were from the UK. As expected, the majority of respondents lived in the UK, given that FutureLearn is a UK platform, and both UoL and ICAEW are UK-based. However, the range of countries partly reflects ICAEW's reach. The South American and Spanish learners probably arose as the author has a colleague with whom she shared the course trailer, who promoted it in educational institutions.

Table 4. Learner location

	Pre-course survey
Country	**First run % of responses**
UK	57.0
Malaysia	3.2
India	2.4
Nigeria	1.7
Spain	1.7
USA	1.5
Colombia	1.3
Mexico	1.3
South Africa	1.2
Vietnam	1.2
Kenya	1.1

Gender

The enrolment data suggest that there was very similar gender diversity on both runs. One of the discussions during course development was how to make careers in accounting and finance appeal to women. Gender equality was a priority of the then (female) president of ICAEW, who was one of the video case study interviewees. According to Morris et al. (2015), 60% of learners on a selection of other Leeds MOOCs were female, but the proportion of female participants varied from 50% on a Leeds innovation MOOC to 72% on a Leeds anatomy MOOC.

Table 5. Learner gender

	Enrolment data	
Gender	**First run % of responses**	**Second run % of responses**
Female	56.6	53.5
Male	43.4	45.5
Other/prefer not to say	0	1.0
Total	100	100

Age

As mentioned above, the course was primarily aimed at students. The proportion of those enrolling in the target age groups (under 18 and 18-25) from the enrolment data was lower than half of joiners in both runs; 15% for the first run, and 39% for the second run. The increase in proportion in the target age groups for the second run indicates that the course reached the target audience in a more concentrated manner for the second run. Morris et al. (2015) report a median age for learners on other UoL MOOCs of 36. Our decision to write the course content without excluding more mature learners seems to have been the right one, given the aqe range of participants. This was done by considering carefully the analogies used in the videos, course text and the discussion forum questions so that they could apply across a large age range of learners (e.g. when discussing personal budgeting, we were careful to discuss ideas of budgeting for a range of life events such as weddings, career changes, holidays, birthdays, as well as events which might be more immediate for the target age groups such as budgeting for university studies or renting a first flat). When referring to accounting and finance skills, we consistently linked these not only to graduate jobs but to possible career changes, recognising that some learners would be taking the course to learn more about accounting and finance with a view to a role or career change from their current employment.

Table 6. Learner age

	Enrolment data	
Age group	**First run % of responses**	**Second run % of responses**
Under 18	1	4
18-25	14	35
26-35	24	29
36-45	20	13
46-55	17	12
56-65	16	6
66 or over	8	1
Total	100	100

Employment status

Table 7 shows responses to the question 'Which of the following categories best describes your employment status?' Those working full time represented the largest proportion of those who enrolled on both runs. This is likely to be due to course promotion by ICAEW to their students (trainee accountants). For the second run, those in full time education represented a larger proportion than on the first run, suggesting that the second run, although smaller than the first run in terms of registrations, reached the target audience in a more concentrated manner. It is possible that as the second run was presented during a university/school holiday period, whereas the first run was during term time, this made the course more attractive to those in education the second time around. Compared with other UoL MOOCs, across both runs, the percentage of respondents working was lower on this course in line with the intended audience.

Table 7. Learner employment status

	Enrolment data		UoL MOOCs ǂ
Employment status	**First run % of responses**	**Second run % of responses**	**% of responses**
Working full time	39	32	65
Working part time	12	12	-
In full time education	10	18	14
Looking for work	11	19	21
Retired	6	2	
Not available for work	5	5	
Self-employed	17	12	-
Total	100	100	100

ǂ Aggregated statistics for five UoL MOOCs delivered in 2015 (physical theatre, anatomy, sustainability, innovation and enterprise), per Morris et al. (2015).

Prior online course experience

For both runs, for around three quarters of learners, taking this MOOC was the learner's first online course experience. The slightly higher percentage having not taken an online course before for the second run is likely to be consistent with the younger profile of learners, and may also explain why fewer respondents had prior online course experience compared with the benchmark data.

Table 8. Learner online course experience

	Pre-course survey		UoL MOOCs ǂ
Online course experience	**First run % of responses**	**Second run % of responses**	**% of responses**
Yes	29	25	43
No	71	75	57
Total	100	100	100

Aggregated statistics for five UoL MOOCs (physical theatre, anatomy, sustainability, innovation and enterprise), per Morris et al. (2015).

Learning preferences

Table 9 shows learner preferences from the pre-course survey. Multiple selections were permitted. The responses for both runs were consistent, with video and quizzes being the most strongly preferred elements. It is perhaps surprising, given FutureLearn's social learning features emphasised on its website, that only about half the learners on both runs agreed or strongly agreed that they would like to learn by reading others' comments or discussing things online with them. This suggests a mismatch between FutureLearn's features aiming to encourage a constructivist, social approach to learning and learner preferences for learning by assimilating content.

Table 9. Learner preferences

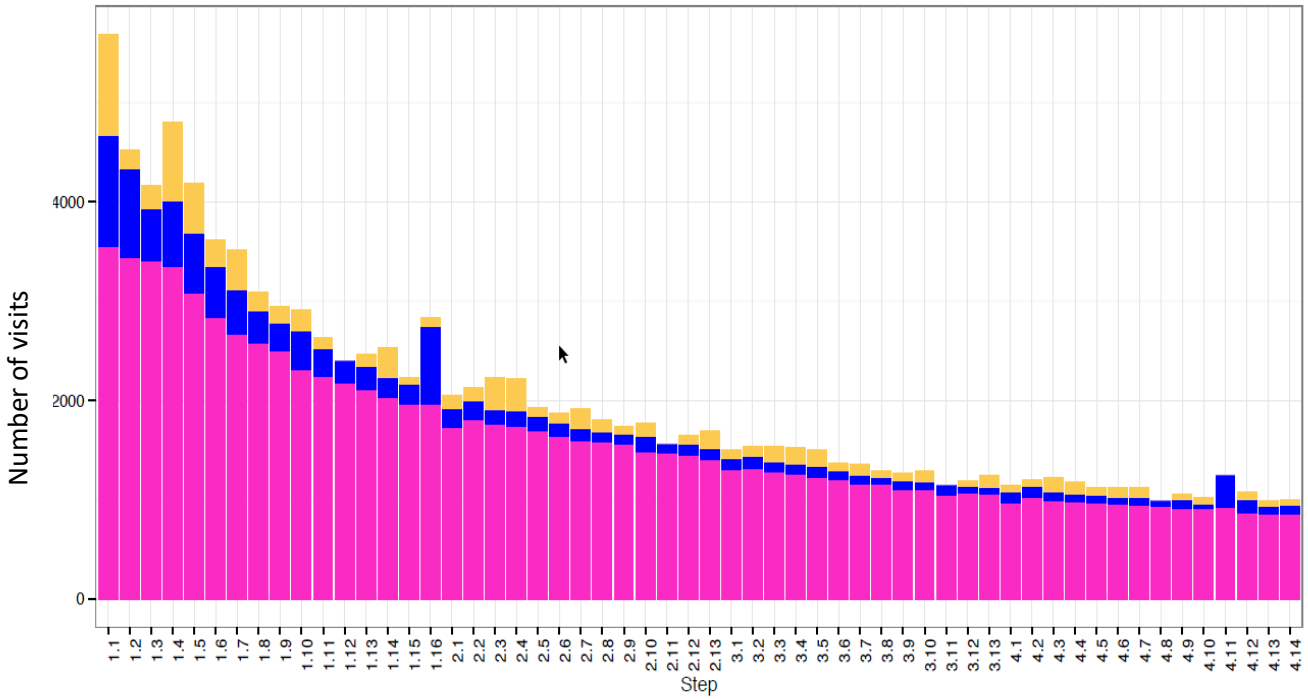
	Pre-course survey	
Learning preferences	**First run % of responses like/strongly like**	**Second run % of responses like/strongly like**
By reading text	75	71
By watching videos	90	91
By reading comments posted by other learners	51	43
By discussing things online with other learners	54	46

By doing quizzes and getting feedback	84	81

Learner behaviour

The step activity data shows for each learner, for each step, when they first visited it, and when they completed it. The visualisation shown in Figure 3 was only available for the first run.

Figure 3. Number of step visits, completions and comments on first run (FutureLearn, 2015)



Key: Pink = completed, blue = visited but not completed, yellow = comments

This follows a general decreasing trend aligned with the funnel of participation (Clow, 2013). There were three peaks of activity that were not aligned with the general decreasing trend: steps 1.4, 1.16 and 4.11.

1.4 was about factors which make a business successful, and included a short video featuring case study interviewees and UoL undergraduate students. Learners had been asked about this in the pre-course survey, and were then prompted to 'Have your say' by reflecting on what they had responded and whether it had changed since watching the video and comment on this in the discussion forum.

1.16 was the course glossary in which all the technical terms used during the course were defined, and it appears from the high number of visits that some learners revisited this step several times as needed. 4.11 was the end-of-course test.

The comments data shows for each participant, for each step comments they made, the time they were made, the comment text and the number of likes it received from others – table 10. As the social learning features such as 'liking' were only introduced on FutureLearn shortly before the first course run, the analysis here focuses on the number of comments, rather than likes.

Table 10. Comment activity

	Run 1					**Run 2**				
	Week 1	**Week 2**	**Week 3**	**Week 4**	**Total**	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Total**
Number of comments*	4,660	1,924	1,306	1,004	8,894	1,430	541	414	260	2,645
% of participants making at least one comment	-	-	-	-	23%	-	-	-	-	21%
Median number of comments per participant**	-	-	-	-	2	-	-	-	-	2

*Includes all comments, including those made by learners and those made by educators, hosts and mentors.

** Includes all participants, including learners, educators, hosts and mentors. Following Swinnerton et al. (2017b), the median number of comments has been calculated rather than the mean because of the highly skewed nature of the data (a small number of participants with 100+ comments each).

This table shows that as well as the 'funnel of participation' (Clow, 2013), there is also a commenting funnel, with the number of comments decreasing every week across the four week run. The median number of comments was modest on both runs, suggesting that many learners did not comment frequently, consistent with the findings of Toven-

Lindsay, Rhoads and Lozano (2015) and Tubman et al. (2016). The proportion of learners commenting was relatively consistent on both runs but lower than the commenting rate reported by Swinnerton et al. (2017b) on other UoL MOOCs. This may be because of the lesser online course experience of the learners on this course compared with other UoL MOOCs, which may reduce willingness to comment due to lack of confidence. Previous online course experience was gauged in the pre-course survey, and as the responses given by individuals cannot be traced to activity once on the course, this is a speculative explanation only.

If comments are one of the proxies for learner engagement, then it might be expected that whether a learner comments or not, and the number of comments they make will correlate with whether they are 'fully participating' (according to the FutureLearn definition, completing at least 50% of the steps and all the quizzes). In the table below, participants who made one comment only were excluded, as many of those who enrolled introduced themselves in a comment on the first step, but did not comment further during the course, so the large number of participants making one comment was skewing the data. Within the commenting data, there is a sub-group of participants who make high numbers of comments, defined as 10+ for the purposes of this study, a similar definition to Swinnerton et al. (2017b) who set their benchmark at 13+ comments, and call these participants 'superposters'. The 10+ comments 'superposters' are included in the 2+ comments participants in the table below and then shown separately.

Table 11. Commenting and fully participating learners

	Run 1	**Run 2**
Number of participants who made 2+ comments	779	269
Proportion of these who were fully participating learners	42%	43%
Number of participants making 10+ comments	206	63
Proportion of these who were fully participating learners	74%	75%

The table shows that a much greater proportion of those making 2+ comments were fully participating learners, than the approximately one fifth of the overall learner population on both runs who were fully participating (see Table 2). Among those making 10+ comments, three quarters were fully participating. Therefore, it appears that there is a link between commenting and participation in the course, which was consistent in both runs (i.e. on the second run, a different population of learners behaved similarly to the first run learners in response to the same course platform and pedagogy). However, it is not possible to infer from the learner behaviour data the underlying causes of the behaviour- whether commenting encourages learners to participate to the end of the course, or whether a feature of highly engaged, participative learners who would participate fully anyway is that they comment frequently.
The most commented steps were all in week 1 on both runs, which appears to reflect early learner enthusiasm. These steps also had in common that there was a specific 'have your say' prompt for learners to comment on particular points or questions. This suggests that a learning design with a specific prompt for learners to comment can encourage engagement. Gore (2018) found that the most commented-on steps on the MOOCs she analysed had questions in the title, which is an alternative way of prompting discussion.

The most liked learner comments were on different steps in the first and second run, but the common feature was that the comment most liked augmented the course materials and provided personal examples.

Course feedback

Post-course survey data was only available for the first run. There were 156 responses, representing 15% of the fully participating learners. 96% of respondents reported that they had taken part in the course throughout. The most common reason given by the 4% who did not was lack of time.

93% of respondents rated the course as good or excellent overall. This compares with 92% reported by Elston and Morris (2015) on six UoL MOOCs. 64% agreed the level was about right, but 21% felt it was too basic. This was perhaps because these respondents were too experienced for this course–the responses to another question on

the post-course survey reported that only 24% of learners had no previous experience in this subject area (the intended target audience).

Learner reported behaviour

Table 12 shows how learners reported they had learnt. Multiple selections were permitted. 'Following links' was not an option on the pre-course survey.

Table 12. Learning preferences: pre and post-course survey responses compared for first run

Learning preferences	Pre-course survey % of responses like/strongly like	Post-course survey % of responses liked/strongly liked
By reading text	75	87
By watching videos	90	93
By reading comments posted by other learners	51	59
By discussing things online with other learners	54	45
By doing quizzes and getting feedback	84	97
Following links to other related content	-	83

Although a direct comparison of these responses must be cautious because the respondents in the two surveys are not matched, those who completed the post-course survey liked reading text and doing quizzes more than those who completed the pre-course survey thought they would. The post-course survey respondents' preference for video was higher than in Gore's (2018) post-course learning design engagement study of MOOC learners across 19 courses, in which 75% of learners reported enjoying videos. Given that perceptions of this subject may be that it is dull and dry, significant attention was paid to making the videos insightful (e.g. by having a range of experienced professionals contributing as well as the two course educators) and entertaining (e.g. by including cartoon and graphic animations to illustrate examples).

The preference for text was consistent with that reported by Gore (2018) at 87%. The course team had again particularly focused on making text concise and providing links to further relevant resources. Learners liked discussing things with other learners less than those who completed the pre-course survey thought they would during the course. Again, this mismatch is of concern given FutureLearn's emphasis on the conversational framework, but this was also reported in the larger scale study (Gore, 2018), with 37% of respondents reporting enjoying discussions the least. This echoes themes in the literature about MOOC learners' frustration with the lack of depth of such interactions. 49% of respondents reported visiting the course a few times per week, and 35% once a week. 36% spent 30-60 minutes per visit, and 34% 1-2 hours. These findings are comparable with those reported by Swinnerton et al. (2017a). 84% of respondents felt the 4 hours per week required by the course was just right, with 9% saying it was it was a bit too little. 76% felt four weeks was about the right course length, with 18% saying it was too short. The most commonly used device to access the course was a smartphone, followed by a tablet and then a desktop computer, then a laptop. This contrasts with the behaviour of on-campus Leeds students participating in an anatomy MOOC, who most commonly used a desktop computer to access the MOOC (Swinnerton et al., 2017a).

Table 13 Shows places of access for the course. Multiple selections were permitted. Despite MOOCs allowing flexible access, the majority of learners chose to access the course at home or at work. Working on the course at home at a desk was the most popular option – which seems inconsistent with the favoured devices to access the course being smartphones. However, it is reasonable to conclude that tablet and desktop computer access could have occurred at home at a desk.

Table 13. Places of access responses for first run

Place of access	Post-course survey % of responses
At work	20
At school/university/place of education	13
Commuting	3
At home at a desk	71
At home on the sofa	32
In a public place with internet access	2
Out and about	3
Other	2

Course feedback comments posted by learners highlighted their appreciation of the plain English explanations, the further resources, the course pace and interactive elements such as the exercises and quizzes as being particularly useful course features. The respondents' favourite course feature according to their comments, was the animations in videos. Suggestions for improvement included more depth, more topics, more examples, more questions and tests and the opportunity to take part in live online chats with the educators. This facility has been offered on other UoL MOOCs (Swinnerton et al., 2017a), but we chose not to include it due to constraints on the educators' time.

Limitations and future research

The surveys are optional and therefore may be more likely to be completed by engaged learners (particularly for the post-course survey which is only sent to fully participating learners) than learners representing the whole cohort (Swinnerton et al., 2017b). Response rates were modest, compared with the number of joiners and learners for each run. Since providing demographic information at enrolment was also optional, enrolment data also provide only a partial picture which may not be representative of the whole learner population on the MOOC. This article addresses the 'cradle to grave' process of MOOC development and delivery and so contains only limited analysis of

learner behaviour. With more sophisticated data analysis techniques, it is technically possible to link the survey and analytics datasets (Morris et al., 2015, Swinnerton et al., 2017a, b). Epistemic network analysis (Shaffer et al., 2009) could be used to investigate the degree of interaction between learners in the forums more deeply. Disaggregated completion metrics have been reported (Hadi & Gagen, 2016) which could be used to develop a more nuanced understanding of learner activity.

Another future research direction is the role of MOOC educators, which, according to Bayne and Ross (2015), is under-researched. This topic is the subject of a current UoL study (Goshtabpour, 2017). Approaches to development and delivery, how roles may alter compared with non-MOOC environments and over time as a course team develops through experience and learner feedback and content and pedagogies evolve, would all be interesting directions. MOOC research is a young discipline, due to the recent development of the courses themselves. There are few studies published so far on business MOOCs and using cross-institutional MOOC learner data. Learner behaviour research is driven by the available platform learning analytics data. Only a fraction of this data has been analysed (Bayne & Ross, 2014; Liyanagunawardena, Lundqvist & Williams, 2015) and although the analysis is quickly becoming more sophisticated (Gore, 2018), it cannot tell us why or how learners are behaving in certain ways. More survey and interview studies are needed to evolve our understanding. Further investigation of causal links between participation in a MOOC and commenting on its discussion forum, in particular, would be an interesting research direction.

Conclusions

Considering the factors suggested by Gore (2018) which may affect learner engagement with a MOOC, the platform and pedagogy were unchanged between the first and second runs as virtually no changes were made after the first run and both runs were via FutureLearn, which did not have significant changes in between the two runs of the course. The population of those who enrolled (age, gender, online course experience, employment status) according to the enrolment data, was similar for both runs.

The pattern of step visits and measures of engagement such as the proportion of learners making multiple comments, and the median number of comments per learner was consistent between the two runs. Those learners who did make multiple comments were far more likely to be fully participating (complete at least 50% of the steps and all the quizzes) than the whole population of learners on each run. Both runs had a funnel of participation (Clow, 2013) with decreasing numbers of learners and comments made as the four weeks progressed. Discussion prompts in steps generated the most comments, but the median number of comments posted was low in both runs, so in-depth discussions were not a significant element of many participants' learning experiences. The timing of presentation differed –the first presentation was in early Autumn during university and school term time, and the second in Spring over a school and university holiday period, so it may be this factor which led to the smaller enrolment numbers for the second run compared with the first run of the course. Two runs of a month long course only six months apart may not be a good idea, because there is limited time to attract new registrants who did not hear about or enrol in the previous run.

The data suggest that we did reach the target audience (learners were younger and less experienced with online learning than those who have participated in other UoL and other FutureLearn MOOCs). This may explain the lower completion rate compared with other UoL MOOCs, as Morris et al. (2015) identify younger and less experienced online learners as less likely to complete. However, a proportion of learners on both runs were older and were pursuing the course for interest or career reasons. The majority of learners were from the UK, but a range of other countries were also represented. Learners completing the pre-course survey expressed preferences for learning using videos, quizzes and text resources, but were less keen on online discussions, which suggests a mismatch between FutureLearn's social learning features and learner preferences. The post-course survey responses were consistent with these preferences, suggesting that the learners did not change their minds about what resources they preferred as a result of participating in the course. Indeed their pre-course preferences (e.g. for learning from video) were confirmed more strongly by the time they had finished the course.

The overall course feedback was very positive, but about one fifth of respondents felt the course was too basic – perhaps because they were not in the target audience

group. Just under one fifth felt the course was too short. Getting the balance right at introductory level, between offering sufficient content and challenge yet making things accessible to a range of learners with no pre-requisite knowledge was a challenge.

Suggestions for MOOC course teams

The factors identified by Gore (2018): platform, population, presentation and pedagogy form a useful set of considerations for MOOC course teams in creating a learning design and course content. If platform is already agreed at institutional level, then the other three factors need careful consideration. Timing of presentation may affect population, and considering what timing may be appropriate for the target audience sought is an important consideration. For niche topic MOOCs such as this one, having a longer gap than six months between presentations may be a good idea, so there is time to market the course to the target audience members who did not know about it on the previous run. Course teams should not be overly concerned with completion rates – given the strong personal interest motivations of learners to enrol in MOOCs, and that they may not intend to complete or measure their own success in terms of completion, but rather whether they achieved their goals. A post-course survey question on alignment between original goals and course experience is recommended.

Course teams should build video in to their learning design, as it seems to be a preferred medium, not just of the participants in this MOOC, but among MOOC learners in larger studies (Gore, 2018). Video with enhancements such as a range of speakers and/or animated elements appears to be an attractive feature of a MOOC and should be designed in to courses, particularly where subjects might be perceived as dull or technical. Learners also appear to have a strong preference for text, so course teams should not be afraid to include some text for participants to read, but need to consider its tone, length and variety of authors carefully.

More explanation of the purpose of the discussion forums and how they can be used to consolidate and deepen learning might help learners to get the most from FutureLearn's social learning features. As well as including specific prompts in steps to discuss particular questions, which might help to encourage commenting, course teams may

need to 'weave' the discussions, beyond simply responding to comments made, in order to foster deeper discussions and more learners making multiple comments.
The interactive exercises on this MOOC received particularly positive feedback, so it is suggested that future MOOCs incorporate such pedagogies if appropriate to the subject. There is clearly an appetite from some learners for synchronous engagement with educators through live chats, so course teams should consider whether they wish to build these in to their course designs.

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