Enabling professional development by letting go of the pedagogical paradigms: considering the role of learning design, data and research in my practice

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This reflective article is a version of my paper presented at the ALT Conference, 3-5 September 2019, Edinburgh (abstract, annotated slides, video recording), exploring the ideas that have influenced how I view online learning design for open online courses. It draws upon my experience as programme lead for online CPD at the National STEM Learning Centre. In terms of my practice context, I am responsible for learning design and delivery of a programme of over 20 free online courses on the FutureLearn platform, for teachers, technicians and industry volunteers working with young people in STEM subjects. The online programme forms a key part of the STEM Learning vision for a world-leading STEM education for all young people across the UK, as well as wider reach with a significant international audience. This document combines the four parts originally published online.

Abstract

Course design models for delivery through open online course or MOOC platforms particularly suit professional development due to the efficiency of knowledge transfer and opportunity for peer discussion and co-learning (Laurillard, 2016). Within the education profession, Louws, et al. (2017) described teachers self-directed learning goals to enhance their subject knowledge and develop classroom practice. This desired learning is readily enabled through open online courses, allowing peer learning from a wide variety of perspectives, whilst remaining situated within an individualised practice context.

However, a contradiction exists in formal learning design between the linear structures of online courses, typically addressing prescribed learning outcomes over a series of weeks, and the empowerment of participants to address varied development goals (De Boer, et al., 2014). Within open online professional development courses, meeting professional needs is a significant motivator for

engagement (Watted and Barak, 2016), therefore course design must balance a generally applicable structure and the capacity for tailoring the experience.

This reflective paper explores the learning design dilemma of how to structure for learning, in order to support progression and meet expectations of course-based learning experiences, whilst also allowing the flexibility of individual needs to be met. It addresses the theme of learning technology for wider impact, considering the reach of open courses and diverse context of learners. Data from several open online professional development courses for UK teachers will support reflections that the learning experience is in fact not determined by the course designer, but instead by the participant, and the choices they make about their own engagement. Open courses are therefore posited as being characterised by an ill-defined, open pedagogy (Cornock, 2018), in that how educators and learners interact, their roles and the learning activity, is not prescriptive.

The concern for the learning designer is how participants will be supported in their choices over how, when and what they will learn (Downes, 2016). Whilst personalised learning designs may address self-identified development needs (Gynther, 2016), there is a dependency upon learner self-efficacy in the online learning space, and the ability to navigate, communicate and commit to a designed pedagogical approach. Empowerment of learners over choice of activities and individualised timelines of engagement, are contrasted with the design intentions of genuine social learning.

These contradictions appear typical of open online learning, but need to be embraced. Evidence from the professional development courses explored in this session show that there are clear positive outcomes for participants by allowing individuals to identify their development needs and draw upon a range of design interventions to meet those needs.

Part 1. Dilemma and direction

The dilemma in the design of open online courses: learning designed vs. learning experienced

The research literature, learning designs and theoretical frameworks that have influenced my role, largely come from technology-enhanced learning and online learning contexts. They characterise the type of learning that learning technology may enhance, enable me to design activities or review the way both learners and educators can interact in an online space (for further discussion, see my SCMALT Portfolio). In many cases, this body of literature and the theoretical frameworks described within, are being transferred, sometimes uncritically, to open online

course design. The more I consider the distinctive nature of MOOCs (massive open online courses), the more I consider how pedagogical approaches, common to other forms of face-to-face and online learning, cannot be defined in the same way.

Throughout, I've been grappling with the dilemma that the 'learning designed' is not necessarily the 'learning experienced', particularly for open online course. What the educator intends, may not be what the learner achieves. This thought started to pose existential questions to me as a learning technologist about the role of learning design, theoretical bases and in particular activity-driven, learning-outcomes based course design.

As I explored some of the literature specifically written about open online courses, I became increasingly sceptical about how particular pedagogies were being evidenced through learning designs, in an almost deterministic fashion. Only recently have more critical perspectives surfaced, for example on whether social learning is actually taking place on social learning platforms. This may be in part due to the hype of MOOCs subsiding, as the real needs that open online courses can address are evidenced, and so within the research literature a more critical understanding is formed to justify this particular form of online learning for particular audiences.

Open online courses for teacher professional development: direction from literature

I have previously indicated how the learning design for online professional development courses I manage have been influenced by activity theory, ideas around interaction and positioning of learning activities according to frameworks. For this reflective paper I draw more specifically on frameworks stemming from literature in teacher professional development and national sector guidelines. Each of the three sources I've selected below offer insights into how open online courses may be most effectively created from a learning design perspective, addressing learner needs and as part of professional practice.

Co-learning

Collaboration, discussion, reflection and evidence-based activities form some of the underlying design principles common to both face-to-face and online learning within the organisation I work for. Whilst there are many frameworks that explore this, there is one type of pedagogical approach that seems to suit the teacher professional development courses as explained by Laurillard (2016). Through a case study of a teacher professional development course delivered as a MOOC, Laurillard cited Avalos (2011) with "co-learning" as an approach, defining this as:

"networking and interchanges among schools and situations and is strengthened in formalised experiences such as courses and workshops that introduce peer coaching or support collaboration and joint projects... the lesson learned is that teachers naturally talk to each other, and that such talk can take on an educational purpose." Avalos (2011:18)

The organisation I work for facilitates this co-learning on a massive scale across a national network of partners and local partnerships in the face-to-face mode. In the translation to the online professional development experience, Laurillard (2016) related co-learning to "peer community learning" (which has a looser definition than Lave and Wenger's (1991) 'communities of practice'). Yet, the sense of community comes from reaching out of the confines of the MOOC itself, due to platform limitations, and I assume also the spaces in which the learners were more comfortable with smaller group interactions. Some of these spaces could also be offline for teachers in the same geographic location taking the course together. Here then the ideas of bridging online and face-to-face spaces are starting to be discussed, and this theme is one that I feel is becoming all the more relevant to the professional development sector (with the acknowledgement it is very much present already in higher education).

Drawing upon some of the specifics of the learning design, what is particularly telling is how Laurillard described the online course in the case study as "curated digital resources with orchestrated peer collaboration." (Laurillard, 2016:5). There may be some criticism here that resources implies an online textbook, but I would argue that the collaborative aspect takes such content a step further. Indeed, the use of the word "orchestrated" through a more literal interpretation suggests controlled bringing together different parts to produce a whole, an experience which could not exist without contributions from each learner. To put this into practice, the technology and technology-enhanced learning approaches from the case study which typify co-learning are:

"Issue-focused discussion forums that elicit valuable community discussions. Peer-assessed assignments that enable teachers to learn from each other. Discussion forums linked to off-platform tools for sharing resources and ideas." Laurillard (2016:14)

Focused discussion is a foundation of online learning design, encouraging a wide range of perspectives to be considered on a specific topic. This, by far, is where the value of peer learning comes into professional development and is well-evidenced in our own online programme. Whilst assignments are not used in the course designs I lead on, we do have structured tasks that encourage review of peer work. In some instances, examples are provided from course authors as part of course content rather than peers, and in other cases through sharing of artefacts created through online activities on Padlet.

Where the educators on a course are themselves teachers, or former teachers, and therefore part of the professional culture of the learners, I argue the co-learning concept should extend to treat educators and learners as peers for each other. This leads to co-learning as a useful concept to position online professional development design, where the purpose of learning from others, in a deliberate and structured way, furthers the independent learning of an individual.

Self-directed

How the independent learning of an individual is supported within a preset of learning activities and designed experiences often leads to discussions of personalised learning, whether in the environment, pathways of learning or choices of activities. Within FutureLearn, the platform used for the online programme I lead, there is no software-based mechanism for filtering which parts of the course meet certain learning needs. Therefore, how a learner identifies their needs and the activities to help them meet their professional development goals, is achieved only through activities and self-regulation.

In exploring teachers' "preferred learning domains ('what'), their preferred learning activities ('how'), and their reasons to learn about a selection of learning domains ('why')", Louws, et al, (2017:171) illustrated the diversity of individual development needs. More significantly, the point that Louws, et al. explored is how these needs may vary due to stage of career. Broadly categorising the goals (learning domains) relating to classroom management, subject matter and student care, the only statistically significant relationship showed classroom management as a priority for both newly qualified and the most experienced teachers (Louws, et al., 2017:177), with other aspects applicable across the career range.

A similar picture is described by Louws respective to means of professional development, with 'reflection', 'keeping up to date' and 'experimenting' all present but having no significant difference in preference across the range of teachers. Whilst this research is not concerned with online learning, the presentation of a broad range of goals and methods makes designing professional learning for even a specific audience of teachers very challenging.

"For many of the learning domains [goals] we did not find any significant relationships with years of experience. This may be due to the large variation in the data. Teachers' self-directed learning is influenced not only by their experience in teaching, but also by current national policies and societal discussions in education…, by school context, and by individual factors related to teachers' professional and personal lives." Louws, et al. (2017:181)

In part, this challenge is answered through social learning designs that enable the tailoring of the learning experience and bending of course content to the personal level through mediated discussions. Designing activities that allow learners to extrapolate from the content, reflect within context and evaluate the relevance of theoretical ideas through practice permit the personalisation. However, it cannot be underestimated the amount of self-direction required to achieve this level of 'higher order' learning.

"Previous studies have already shown that teachers do set their own learning goals and direct their own learning, although they might need some assistance in this process of reflection and enactment." Louws, et al. (2017:182)

The skills required to self-direct professional learning, motivate and sustain development are particularly important in the teaching profession. Within the classroom environment, teachers need to make judgements about their students learning and the actions they take as a teacher to support that learning. It requires a reflective and analytical perspective on practice. The same degree of reflection and analysis must apply through the learning experience of professional development.

Sustained and embedded

Self-directed learning is also pertinent within UK frameworks, with the Department for Education Professional Development Standards emphasising the need for sustained and embedded programmes of activity. When this is applied to open online learning, the choice of courses and sustaining engagement in these courses often falls very much down to the individual learner, where course deliverers provide support at a distance. Over the last 18 months, the online programme I lead has established pathways through courses, where courses may work best for the learner if taken in sequence or at stages of their career. Though the courses do not sit within a formal or accredited programme, they can be used by individual teachers, departments or whole schools to create bespoke programmes of development.

"Professional development is most effective when teachers: seek programmes that typically last at least two terms and which provide a sustained rhythm of ongoing support; translate ideas into relevant practice and knowledge for specific classes and pupils, making time for ongoing practice and review… [And] providers of professional development: … support participants and their schools to sustain and embed change and link shorter activities with sustained programmes." Department for Education (2016:10)

There are other aspects of the Department for Education guidance which, whilst not referring to any form or method of professional development, appear to transfer well across both face-to-face and online learning spaces.

Traits of professional practice

Combining the three perspectives of 'co-learning', 'self-directed' and 'sustained practice', it is clear that these are traits of professional learning. Yet, the means for supporting individuals to develop these traits, particularly at a distance, is poorly researched.

With the increasing emphasis on digital competencies, learning at a distance, self-regulated learning, and online communication skills, to name but a few, are all needing to be developed by learners with as much focus as their professional development goals.

As I will explore in subsequent posts, the underlying pedagogy of 'social learning' which is an embedded part of the FutureLearn platform should not necessarily be the only pedagogy that courses are designed for. Social learning itself requires skills and competencies of online learners, perhaps not addressed through previous formal education. Further, the research basis to justify particular pedagogical decisions often stems from analysis of platform data which I will argue is rarely viewed critically.

As I aim to best support my learners in meeting their professional development goals through online learning, I see many contradictions in open online course design. What I am debating at the moment is how far the existing research and perspectives can inform learning design decisions.

Part 2. Contradictions of open online course design

Personal needs vs. sequence of activity

In previous work (Cornock, 2018), I have touched upon the difficulties inherent in developing a course that, through its open access brings learners with diverse learning goals (DeBoer, et al., 2014), and the design contradiction of a predetermined sequence of activity. Even the navigation through a course in a non-linear pattern is implicitly constrained by how a course is presented on a platform with clear structure. For the courses I lead, the platform is FutureLearn which adopts a weekly layout and numerically numbered course pages (steps).

That is not to say that having a structure itself is at a detriment to learning, as a logical progression through content, with content grouped by theme, headed up and placed within a manageable weekly schedule provides a learning structure. More exploratory forms of presentation, such as mindmaps, many interconnected pages, even Padlet-like boards of content nuggets would struggle to support linking of specific concepts to a bigger picture or conceptual narrative that would better propel learners through sequential content.

However, there is a question as to how learners who have a specific learning goal in mind locate the activities and content to help them meet that goal, without proceeding linearly through a course. Part of this is due to the perception of linearity, with the expectation learners may have that course completion requires a linear progression. In my view, this comes from trained behaviours of formal education, where it is expected to complete a course by undertaking every task and viewing content in a linear sequence.

This is in complete contrast with informal learning, which tends to meet more immediate development needs. Consider the example of functional needs, such as knowing how to use a formula in Excel. This can be met in a non-linear way, by experimenting, searching online, watching a video or reading a help file. It may be that the content first accessed is too detailed, or not sufficient to resolve the development need, therefore there is a more iterative process which gradually refines the choice of learning content and task in tandem with experimentation. Such an approach is perhaps more akin to problem-based learning in formal settings. In open online courses, further exploration is needed to understand whether learners adopt such iterative approaches to addressing development goals over longer periods of time.

Individual timelines vs. socialisation

If discussion and collaborative activity are key aspects to the learning design, then there must be some form of synchronicity of activity (even within 'asynchronous discussions'). Learners need to be present within the same space, and whilst not at the exact same time. There needs to be consideration then, what the window of opportunity for collaboration may be.

FutureLearn learners can join courses up to 11 weeks after the course start date. Most learners will join within the first week of the course starting, and therefore most discussion, interaction and collaboration happens in sync. However, with an increasing proportion joining after, it is difficult for course designs to still enable the benefits of social learning.

Similarly, the weekly structure of the online course can be sidestepped, where a learner takes a week off and then returns where they left off. They are now out of sync with the majority of learners, and indeed out of sync with any weekly-timed emails.

Finally, where there are calendar-based activities, such as recorded Q&A sessions with educators, there are learners who have kept pace with the course from the start date and are in the best position to contribute as well as learners fresh to the course. Both should be welcomed to participate, and in some cases the Q&A acts as a personal signpost from the educator to the learner to indicate which parts of the course would be most relevant. Therefore, activities, whether

'asynchronous' or 'synchronous' have to be designed for a wide range of individualised learner timelines and pace.

"It is not only the magnitude of data, but also the diversity of user intentions and backgrounds and the unconstrained asynchronicity of their activities that distinguish the MOOC context from conventional classrooms." DeBoer, et al. (2014:82)

DeBoer, et al. (2014) talked about the way learners use open online courses differently, to meet their individual needs. The idea of 'unconstrained asynchronicity' wonderfully encapsulates the idea that learners will be engaging with a course when and where it works for them, doing activities flexibly and even joining the course out of sync with other learners and facilitation periods. This presents us with learning design challenges, how to ensure our learners can still undertake professional development both in terms of social and instructional pedagogies, with and without support.

Openness of access vs. self-efficacy of learners

The third contradiction I am considering is based on the supposition that open education is open to all. In order to access open online courses, there are various technical hurdles to overcome, arguably less so than in previous decades. There are also issues of awareness and how many individuals know that this form of learning exists.

The issue of self-efficacy of learners to learn online is the biggest challenge I view for the effectiveness of open online learning. Within an open online course there may be experienced online learners, those who have the collaboration and communication skills to further their learning through interaction with others, or those who are new and consider the course as an online textbook, passively consuming, but limited in self-motivating cognitive effort. A learning design has to bridge these two extremes, catering for those who both want to learn, but are not sure how to maximise their learning, and those who can steer their own path.

"Ultimately, if people are to become effective learners, they need to be able to learn on their own. They need to be able to find the resources they need, assemble their own curriculum, and forge their own learning path. They will not be able to rely on education providers, because their needs are too many and too varied." Downes (2016)

I would argue that there is a tension where open online courses require a form of learning that is simply not trained to learners through traditional educational systems. In schooling, and some respects modular-based higher education, there is a linear path to follow and a curriculum laid out by the educator. As Downes (2016) described, to meet personal learning needs, a learner really has to hold

the skills required to draw upon what is most relevant to them. This way of thinking about learning, as alluded to by Downes, requires a shift of direction from the deliverer of education to the learner themselves. A learner needs to be confident in making decisions about which content and activities they will and will not undertake. This is efficiency of learning, as much as effectiveness.

Implications of these contradictions

The variation of learner goals on open access courses and the diversity of learning self-efficacy does provide learning design challenges. In a MOOC purposed for educators (a skewed audience already), Salmon, et al. (2017), noted:

"Those participants who were able to be flexible and move quickly and easily around the MOOC (we called them "agile learners") had a greater capacity to adjust to the MOOC experiences and adjust their original expectations if necessary." Salmon, et al. (2017:1290)

Considering their learners were educationalists, it is surprising that this 'capacity' to be an 'agile learner' was not ubiquitous. Though the demographic Salmon, et al. (2017) indicated had a significant proportion with previous experience of MOOCs specifically, not just online learning, it perhaps could be suggested that even having prior learning through open courses still does not lead to an understanding of how to best learn online. Milligan and Littlejohn (2016:117) suggested otherwise, where "experienced MOOC-takers often talked… about how they had settled on an approach to MOOC learning." Their MOOC for health care professionals identified, in the majority, learners had confidence and learning skills to complete activities and sustain engagement. In the minority, learners would acknowledge time is required to have a deep understanding but fail to allocate appropriate time to complete the course (Milligan and Littlejohn, 2016).

Whether a learner succeeds by their own definition or by the course designer's, may be due to how many open online courses do not scaffold or facilitate the reflection of the learning experience itself. Both Milligan and Littlejohn (2016) and Salmon, et al. (2017) suggested strongly the role of scaffolding learning approaches and enabling self-motivation to meet development needs. Both studies also concluded with recommendations for developing pathways through the content, "routes through content that suit their specific goals and motivations" (Milligan and Littlejohn, 2016:120). Yet, this appears to reiterate the complexity of the design contractions above. At one end of a continuum of self-motivation and learning skill, learners require support to sustain their engagement and purpose the content in their own contexts. This is probably best supported through facilitation. At the other end, the learning design itself, for

facilitator support is not always available, must enable learners to realise they can self-direct, be flexible and find their own path.

"Identify typical participant cohorts and their likely desired expectations of the process of the MOOC, especially the behaviours of other participants and offer alternatives pathways, if deemed necessary;

Identify typical participant cohorts and their likely range of motivations, and, if in a large MOOC, offer different pathways through the materials to account for different motivations and expectations;

Encourage participants' reflections and articulation of unexpected and emergent benefits of their continuing commitment to the MOOC..." Salmon, et al. (2017:1291)

Some of the practices that support learners to identify their pathway have been embedded in the online courses on the programme I lead. This includes tasks to elicit development needs, reflection steps and importantly discussions to contextualise course content. These 'self-audits' currently only focus on the subject knowledge of the course and not on the capacity of the learner to undertake professional development. In a proposed design model to address some of the issues raised above, Gynther (2016) described an adaptive design framework.

"The design must be able to: identify the participants current skills – visualized in a competency profile; visualize a competence-gap in terms of a personalized curriculum; recommend a learning path which adaptively matches the learner's personalized curriculum; identify the student's ability to learn in and with a MOOC; establish an adaptive scaffolding of the student's learning process in the MOOC." Gynther (2016:20)

The impression is a very complex platform that delivers a fully tailored curriculum for the individual learner, though mediated with blended learning to involve some degree of interaction between learner and educator in the choice of the learning pathway. However, Gynther (2016) regularly refers to difficulties in delivering certain learning activities, particularly in the face-to-face environment of the blended approach, where learners have highly personalised course pathways.

For fully online professional development, the limitations are more likely to come from the lack of personalisation or guidance to personalise learning. The offline aspects, such as implementation of course concepts in a professional practice, are instead highly personalised by context. There appears then to be significant value in the type of learning activities that allow a learner to find their

own route through course content, by taking that course content, or not, back into their professional practice space.

Facilitation does play a significant role, and as Bonk, et al. (2018) suggested, online facilitators and course designers can use a range of educator-led personalisation approaches, such as "feedback techniques, pedagogical activities, resources, interactions, and assessments to address learner needs" (Bonk, et al., 2018:106). Lack of facilitation is not necessarily the issue, and is not the underlying issue from which the contradictions above emerge. The design challenges are more to do with enable learners to realise their learning goals through the bridging of the highly structured and linear course design and the highly personalised offline learning space.

Further, each of the design recommendations, perhaps more implicitly than explicitly, still focus on the completion of a course. Note 'continuing commitment' is the purpose of ongoing reflection as much as discovery of unintended learning outcomes. The course design still resides very much within a formal linear narrative, though the intended engagement may be non-linear or selective. In professional learning, as Milligan and Littlejohn (2016) explained, some learners will be motivated to complete from the outset, others complete to receive certification, but there was little exploration of the value of more selective learning engagement. Achievements in online courses, such as certification, only come from completion. Partial completion that has still met the individual learners' needs, may be presented, wrongly perhaps, as a non-achievement.

In the next post, I will draw upon data from several open online courses to explore learner engagement patterns. I will argue the case to look beyond course completion and instead look to outcomes of a learning experience.

Part 3. Data

Retention curves mean nothing

Three contradictions in open online learning have now been considered: how personalised learning pathways are enabled within a structured, linear course; how individual timelines sit within flexible, asynchronous enrolment and participation; and whether the openness of course design demands a level of learning competency for effective engagement.

In order to make sense of these contradictions and to get a better picture of where learning designed intersects with learning experienced, many researchers look to analytics available within course platforms (Swinnerton et al, 2017). Data from learners' views of content pages and quantity of comments are interpreted as a proxy for learning engagement. In much of the literature on MOOCs, retention curves are prevalent:
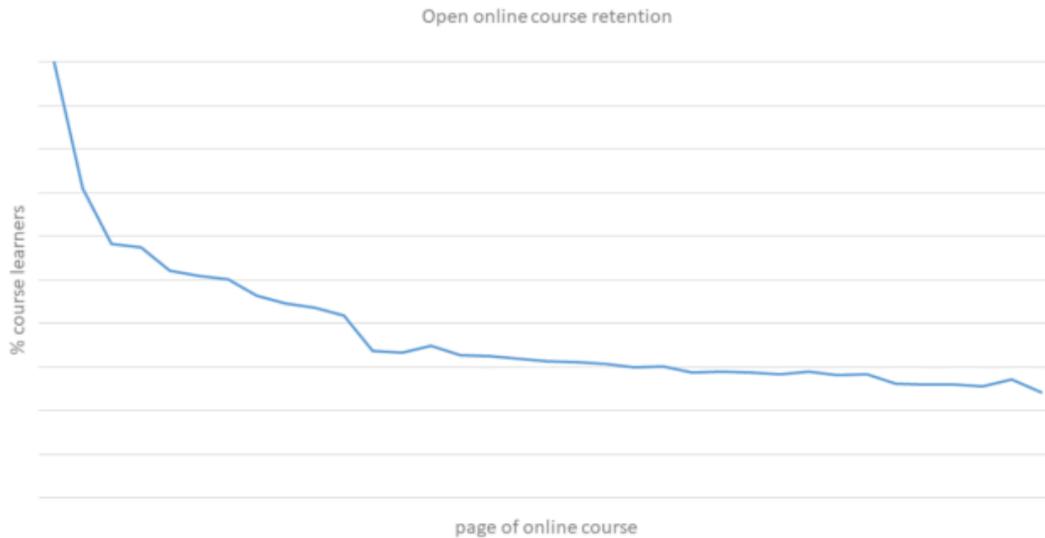
% course learners

page of online course

Figure 1. Example of open online course retention graph

These graphs are typically logarithmic or inverse exponential in shape, with a significant drop off in the first few pages of the course and a long tail as participant wanes through each of the course steps (de Freitas, et al., 2015; Ferguson and Clow, 2015). There is little nuance to these graphs, and in the worst case inferences are made based on minor deviations from the logarithmic trend line. In general the picture tells us very little about the choices that learners are making about how they use the course, the affect of course design and indeed the type of learning experience that online courses offer. Learner choices, and learner intentions, are key factors when interpreting such data, with many studies exploring the link between intention to complete at point of enrolment or throughout a course (Henderikx, et al., 2017; Reich, 2014). Therefore, interpretation of these graphs absent of an understanding of learners carries a high risk.

These retention graphs are based on assumptions of learner behaviour from pedagogies grounded in face-to-face education: assumptions about linearity of courses, intention to complete, learner motivations and the meaningfulness of completion. Such assumptions are challenged by DeBoer, et al. (2014) who suggested that the open nature of these courses require different forms of understanding of enrolment, participation, curriculum and achievement.

An alternative view of the data is to look at retention on a week-by-week basis (acknowledgement to Seb Schmoller and David Jennings for the suggestion). This shows quite markedly that after the first week's content, the attrition is much lower on a week-by-week basis. This is the same as the gently levelling out of the overall course retention curve, where learners who reach a certain point in the

course are more likely to continue through subsequent weeks. However, this weekly picture offers up indicators of particular points in the course where learners are drawn to course content.

Open online course retention (proportionally by weekly learners)

Figure 2. Example of open online course weekly retention

For weekly retention, as the example above illustrates, the percentage of the total of all learners accessing at least one page of content that week is shown for each individual content page. For example, the first page of the third week is approximately 90% of all learners who accessed at least one page that week; not all learners accessed the first page of the week. That alone is a surprising point. The weekly retention graph (Figure 2) shows more the clearly peaks of activity during each week, which for this course related to the educator Q&A sessions, but also that the last week of the course learners access more sporadically the course pages. Whereas most weeks have a noticeable peak at the start, then a continuous trajectory down by 10%-20% at the end of the week, the final week starts lower. This last week's observation is interesting, as it may be implied, by the end of the course, learners are far more selective about which pages they will view.

Whilst the second of these two graphs provides a bit more information, there is still an undue emphasis on course completion as the overriding metric of interest. Indeed, in platform bench-marking data, course completion is often used, erroneously, to indicate course performance. In some cases, the literature similarly places emphasis on completion, influenced by preconceptions of learning experience which stem from face-to-face design:

"Learner retention is important as a measure of MOOC success since only those learners who persevere with a course have a chance of reaping the intended educational benefits of the learning experience." Hone and El Said (2016: 158)

Referring back to the contradictions of open course design, where we are aiming to allow learners to meet individual needs, course completion is at odds with this intention. By focusing on retention, as educators, it is as if we are setting a precedent that all of the course content is relevant to all of the learners.

This is simply not true, and contradicts the notion of identifying learning needs which forms a significant part of professional and personal development courses. As such, Hone and El Said's (2016) statement that connects completion with benefits from the learning experience, whilst perhaps reflective of the specific learning outcomes designed for a course, downplays the potential unintended learning outcomes from a social learning experience.

Open online course success measures need to focus on outcomes; we need to let go of retention

Retention as a metric itself, is also influenced by choice of platform. In the case of FutureLearn, learners must tick a completion icon on each page in order to be eligible for a certificate. The motivation for indicating completion is mediated by the end-of-course recognition, rather than the intrinsic motivation of using the completion indicator to keep track of learning progress. In some courses a statement has been added by course designers on the bottom of every page to remind learners to mark their completion. These gentle nudges, it may be assumed, boost the performance metric of the course. However, how far those gentle nudges actually support learning is unclear.

Platform characteristics and processes implicitly contrast with individual learning needs, again emphasising completion over selection of content. Instead, emphasis on measuring outcomes, either self-reported or through submission of some form of learning artefact, provide stronger indicators of professional learning goals being addressed. Such outcomes are similarly more reflective of participation, discussion, and collaboration, and are dependent upon a varied cohort with their own understanding brought into a social constructivist learning design. This causes uncertainty in the field of academic assessment, however within professional and personal learning, the diversity of outcomes is a realistic expectation due to the varied workplaces and motivations of individual learners.

"Enrolments occur at different times and for different reasons. Different participation metrics have low correlations across resources. User interaction with curricular resources happens at different times, in different sequences, and at different rates. In addition, conventional measures of achievement seem to be

disconnected from what many users intend to achieve. As a result, we recommend a general conceptualisation of these variables in terms of individualised and informed user intentions." DeBoer, et al. (2014: 82)

Faith in the data

If retention data does not capture the learning, nor reflect the nuances of learning interactions, then other platform analytic data available may be drawn upon (rightly or wrongly) to infer the success or not of learning designs. This may include the number of comments, time taken to progress through a course and light-touch subjective feedback such as positive/negative ratings at the end of the week.

Like many learning designers, I am tempted to seek patterns in the data to explain learning taking place. In some of the research literature, conclusions are being made about how learning takes place using any data available on a course platform. Yet, the reliability of that data is rarely mentioned in research literature. For example, those familiar with FutureLearn will know that the data sets which are available to download stop counting engagement after a certain point. That's fine when you consider that hundreds of courses could otherwise be processing engagement statistics forever more! Though, researchers don't get a complete picture of learner engagement for those who join a course significantly after a deadline.

The data sets produced by the platform also include the course team, and particularly with smaller cohorts their involvement can also affect the data patterns. This filtering, cleansing and sense-checking of the data is not always indicated in literature (refer to my process). As such, I spend a lot of time unpicking the validity of data from platforms and the correlations within.

When the availability of data allows inferences about learning, is this faith in data misplaced? Numbers cannot account for 'life gets in the way'. Measures of success from interaction data look for engagement, and do not surface the decisions not to engage. Such decisions not to engage are as crucial for educators to understand as the decisions to engage. Data from platforms are not measures of learning intention, choices over learning and learning outcomes on their own.

When learning design decisions are based upon successes, they stem from a misconstrued view point that comes from 'all activities on this course must be relevant to your needs'. Non-engagement is not necessarily a failure of design. Non-engagement itself reflects a type of learning that was not designed-for, or perhaps not designed to take place within the online course. Where then does this leave critical learning design?

In the next post I will look at a possible use of data to explore learning rhythms and how these can be incorporated into more innovative learning designs.

Part 4. Learning rhythms

Learning cannot exist solely online

Learning takes place across spaces, as such online learning is always 'blended'. An online course will involve an individual sitting at a computer, or perhaps with their mobile phone in their hand. They may be at home, or at work, or travelling. The learning environment may be situated within their professional practice, or in their personal space. The key point though is that data provided through online learning platforms doesn't capture the full 'blend' of learning taking place.

Where learning is taking place is important to consider, particularly in the scope of professional development, as the interplay between learning activities and the learner's context, where new ideas may be implemented and reflected upon, is at the heart of many professional development learning objectives. Rarely are online courses created in the professional development sector simply for learners to 'know' something new. It is the action of putting something into practice that is significant.

"An over reliance on log file analyses and click stream data to understand learning leaves many learner activities and experiences invisible to researchers… participants reported that their participation in MOOCs varies according to the daily realities of their life and the context of the course. Learners'descriptions of how these courses fit into their lives are a powerful reminder of the agency of each individual." Veletsianos, et al., (2015:582-583)

The data cannot capture when and how practice is implemented, at least not through measuring clicks in the online space. Neither can it capture the offline conversations and how learners have worked with colleagues to further their understanding. Platform data must be complemented with, or even viewed through, a lens provided by the learning outcomes of a course.

Outcomes, not clicks

Whilst learning outcomes are integral to the learning design, personal learning outcomes may vary from what has been prescribed. The transference of professional development activities into professional contexts will give rise to learning outcomes that may be unanticipated, outcomes that have not been designed for, and which, perhaps designed learning activities do not support. The learning outcomes from any course may therefore be influenced not just by the activity, but the context of the learner as much as anything else (Figure 3). Data from online engagement with a learning platform may be representative of

designed learning outcomes, but cannot reliably describe the individualised professional and personal achievements of learners.
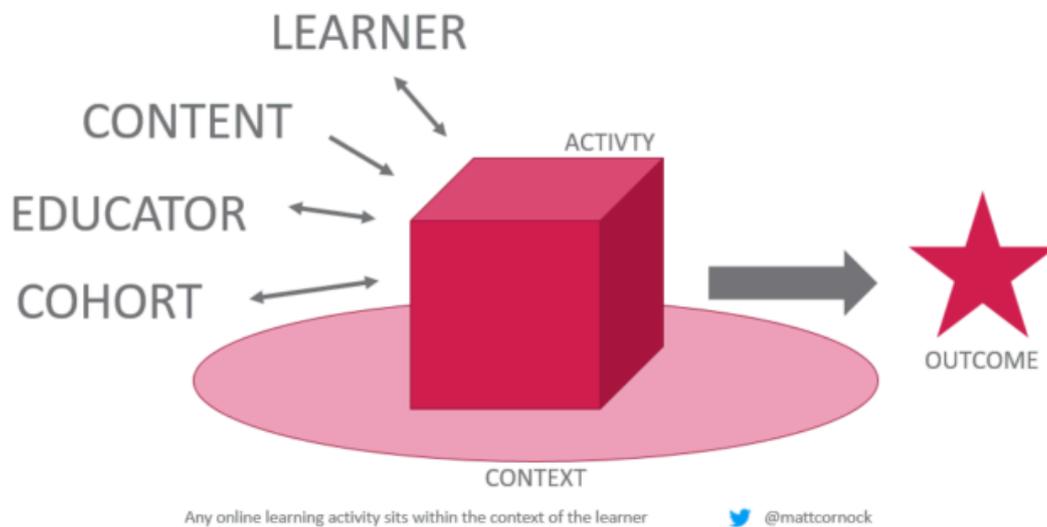

Figure 3. Learning activities are placed within context;
the context informs the outcome

Using data alone to infer learning outcomes and effectiveness of learning design can therefore be fraught with complexity. However, the data does show patterns of engagement with courses and these in turn may be used to infer learning behaviours, if not outcomes. Reviewing these patterns may in turn suggest ways the designed course meets, or does not, the professional development needs of individuals.

Linking learning and practice needs scaffolding

Being able to transfer learning from a designed activity into a practice context requires a level of translation on the part of the learner. It is already well established that learners on open online courses tend to have a high degree of learning skill (Conole, 2015). Yet, it can be argued that this learning skill is developed within traditional learning situations, rather than self-paced and self-directed as is the case with open online courses. Learners should be supported to learn and develop using open online courses.

The aspects that Conole (2015) explain underpin an effective learning design for open online courses, could form the foundation of a learner support. For example Conole proposes a course vision document containing:

"The pedagogical approaches used. The core principles of the MOOC. The nature of the guidance and support provided. The types of content and activities. The forms of communication and collaboration that are encouraged. The ways in which

reflection is encouraged and how the participants can demonstrate achievement of the learning outcomes." Conole (2015:248)

Whilst the purpose is in the first instance for the course designer and author, the same information could be of value to learners. This helps to set expectations of the purpose of the course, from the design perspective, and by doing so will enable the learner to compare their intended form of engagement against what has been designed.

In fact, this 'learning how to learn' does not need to be formally explained but could be integrated into the design of activities. This is crucial within short, open online courses, where the learner may be looking for immediacy over learning outcomes. Time may not be fully allocated, from the learner perspective, to learning how to learn. The data shows that perhaps, online learners in MOOCs and open courses simply follow previously known routines. This has big implications for allowing an individual learner to be able to contextualise the course content and achieve learning outcomes relevant to their practice.

What the data shows about MOOC learner behaviours

Most participants will take the course in a linear pattern.

The graphs below are indicative of patterns found in the professional development MOOCs I manage. The x-axis represents each course step (page of content). The scale on the left is the displacement of first access to a step. This is the mean (average) of the modulus (i.e. value, not negative) of deviation from a linear pattern.

For example, if a learner started by visiting step 1, then visited step 2, then visited step 3. This is a fully linear pattern. The value of each step's deviation from the linear pattern is 0. If the learner started by visiting step 1, then visited step 5, then visited step 4. The deviation would be: 0, 3, 2. Step 5 is three more than the expected next linear, which is step 2. Step 4 is two less than the expected next linear step from 5, which is step 6.

This may come across as a little contrived, but it overcomes the typical pattern of attrition exhibited in open courses (steep drop-off, as explained by Ferguson and Clow, 2015). Instead of looking at the cohort as a whole, we are now looking at individual learner behaviours. The graphs below show that in the majority of cases, engagement with course content is indeed linear. The peaks show parts of the course that learners deliberately reach out for, outside the linear flow. Typically these are steps at the start of each week, but also key summary steps and features such as Q&A recordings.
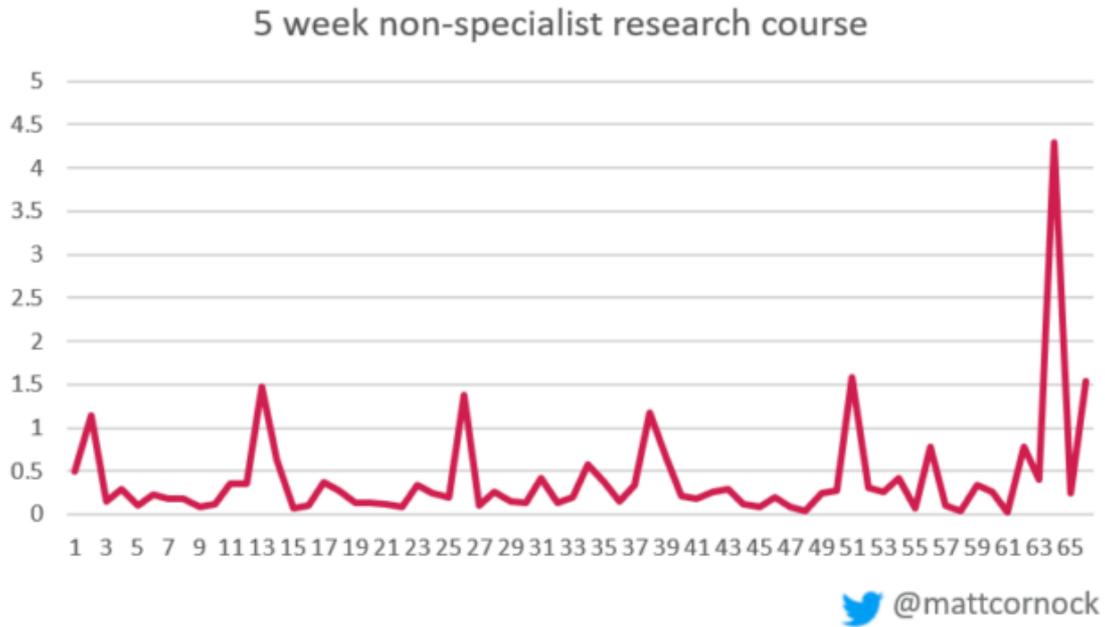
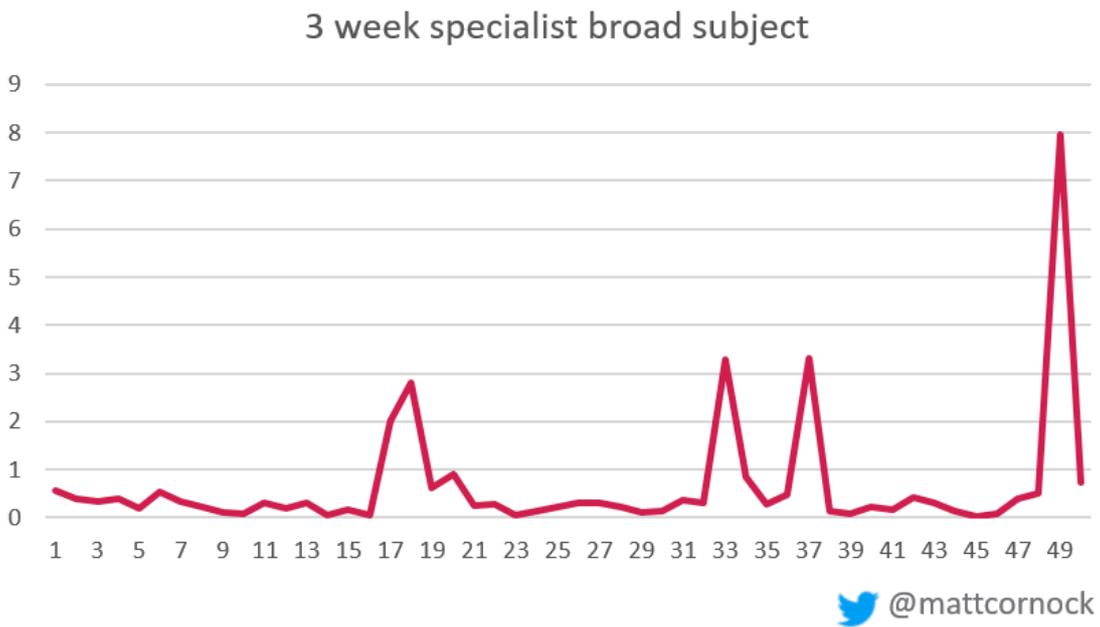Figure 4. Linearity of step visits on a 5 week course

Figure 5. Linearity of step visits on a 3 week course

Some courses had less pronounced peaks at the start of weeks. The course providing research and evidence to inform practice (Figure 4) has more linear week-by-week engagement compared to a course which is more about specific practices (Figure 5). This might be inferred that learners are selecting new approaches that they wish to develop, or drawn to highlighted content (for example steps promoted in course emails). Also note-worthy is that very few

participants will start elsewhere than at the beginning. Across the courses analysed, 10-13% of learners entered the course not on the first step.

However, interpretation of these graphs still holds the caveat that the learning platform itself will also influence behaviour. When a learner joins a course on FutureLearn, they immediately visit step 1.1. They then click through step-by-step through the course. Only if they actively visit the weekly layout will they see the complete course content, grouped steps by theme and truly be able to adopt non-linear approaches to course engagement.

Social learning is not mandated

Whilst the platform influences some behaviours, others require a greater sense of purpose from the learners themselves. 20%-30% of learners comment on the professional development courses analysed here. Yet, every step (with only a few exceptions) will have a learning activity that leads the learner to make some form of contribution. Each step on FutureLearn has a comments box, which learners often use in a variety of ways. This may be to post their own thoughts, to provide an active contribution, express an opinion on the content, or simply to acknowledge they've read the step.

Since amending the style of how activities are written to include a clear verb-based heading, (anecdotally) we have noticed fewer of the short, one-line remarks on the course, and more detailed, thoughtful contributions to the course comments. Thus, a richer experience for both contributor and non-contributors who may learn from the ideas and experiences shared from others.

Most comments are not replies to other learners. Again, this may be due to the social learning pedagogy requiring interpretation and understanding on the part of learners. The act of commenting upon someone else's thoughts, ideas and experiences, may seem daunting and carries risk of misinterpretation. What is clear is that completion patterns differ (statistically significantly) based on: commenting, responding to others, or receiving a response to comments. However, again, there is a caveat that completing gives more opportunity for commenting (Swinnerton, et al., 2017). Behaviours can be suggested to learners, with reference to types of contributions that they could make. For example, in the Quick Guide to Effective Online CPD for each course, learners are encouraged to "offer your understanding; pose questions to the group; respond to others' contributions; provide support; share your experiences." These are loosely based on the suggestions by Laurillard (2012) to categorise approaches learners may take when contributing to discussions:

"Question… Explanation… Conjecture… Comment… Critique…" Laurillard (2012:153)

Again, what the data fails to capture though is how the activity is placed in the learner's context. A single learning activity could well be a reflection exercise for one learner, or a stimulus for offline discussion or experimentation for another. Though designed within a 'social learning' pedagogy, the learner is not tied down to this pedagogy as, particularly with open online courses, they have full control over their own engagement with that activity. How that activity is interpreted, and importantly acted upon, will be dependent on the prior experience, capacity to change practice and ability to reflect, which will be unique to each learner. Therefore, an online learning design doesn't have to fit one pedagogy.

What is the impact on learning?

Although most learners still exhibit patterns of linear behaviour, whether through the ingrained traditions of education or implied patterns due to platform interfaces, those that do complete open online courses are capable of achieving learning outcomes that are valuable to them. There are many features of open online courses that allow this flexibility of both pedagogy and learning achievement: the mix of the cohort, the time-independence, the structure and form of content. Personal ownership of learning arguably also plays a crucial role. Here are just two quotes from learners:

"Love the structure – bite-sized pieces, and very useful discussion from participants. I'm new at teaching biology, feeling much more confident about planning." Learner feedback

"Seeing the practical aspects of this and exploring the comments and activities suggested by this learning community has been superb." Learner feedback

These quotes, perhaps subtly, indicate how different pedagogies have been adopted by the learners: both acknowledge the value of discussion; the first explicitly notes the 'bite-size' approach; the second notes the clear links to practice; the first also has a clear personal driver to boost their confidence.

Currently, the learner feedback is only representative of completing learners. Those who decide not to continue to the end of the course, for whatever reason, are unlikely to skip to the final page and offer their reflections on learning. However, 98% of learners surveyed indicated a high or medium impact on themselves after completing one of the professional development courses. With such a diversity of needs and learners, yet with pre-defined activities, for that level of impact we cannot assume all learners are learning the same way.

Open pedagogy

On a personal note, when I first started designing and managing a programme of open, online courses (MOOCs) for professional development, I said that I had to rethink everything I thought I knew about online learning. Social constructivism

and communities of practice just didn't seem to work the same way in open courses lasting at most 5 weeks and with many different levels of experience, knowledge and learning goals within the cohort. Yet, as the data and success measures repeatedly show, open online courses don't have to abide by the rules of a particular, specific and defined pedagogy. The pedagogy can be open (Cornock, 2018).

To conclude then, I am still very much steered by a particular learning approach at the design stage. As any professional does, I make a choice about the type of learning technologist, course designer, educationalist I want to be. This is influenced by my own prejudices about what I believe to be 'good learning' and the research I select to justify my position. In course design, I have a responsibility to be open about this, to explain to learners how the course has been designed a particular way. However, open online courses have the potential for us as learning designers to also acknowledge the value of learning in a different way to how the course has been designed. Rather than seek data to support our designs, we need to find ways to use data to best support learners in achieving their development goals. Alongside challenging learners with the course content, I also need to be challenging learners in their approach to professional development through online courses, and this includes empowering learners to make choices about what they will and won't engage with. In doing that, they will both meet their learning needs and be open to unintended learning outcomes too.

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