

# Anatomy of a MOOC for Teacher CPD

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## The Course Team

The members of the Course had worked together to produce the three publications from the UNESCO Institute for IT in Education, on which the MOOC was based (Kalaš et al., 2014, 2012) +...

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## 1. Executive summary

### 1.1. Set-up and design

The aim of this MOOC was to promote the use of ICT in Primary Education, especially in those countries where this is uncommon. It was developed on the Coursera platform, in collaboration with the UNESCO Institute for IT in Education, based in Moscow and the University of London International Programmes, by a team of 8 international instructors. The course ran for 6 weeks, May-July 2014, providing up to 10 hours study per week. It provided a Statement of Accomplishment at no cost, and a Verified Certificate of Attendance at \$49.

The course was intended as a CPD course for primary education leaders, teachers and policymakers in all countries, to provide access to key materials and resources, and the opportunity to exchange ideas and experiences from their own institutional and national contexts.

The pedagogy of this CPD MOOC followed the standard CPD format of curating resources and orchestrating peer collaboration. The pedagogic principles governing the design of the course were:

- To curate the most useful evidence and resources for teachers, heads, and policymakers
- To orchestrate peer collaborative learning to build the teaching community knowledge of using digital technology
- To guide study planning by providing core and optional elements, and recommended timings
- To engage participants in making best use of learning technologies through guided active, independent and collaborative learning
- To provide the tools and activities that enable participants to build their learning on the course into their working practices.

The total costs for preparation and design in advance, and for the support during the running of the course, are estimated at ~£22,000, which is low in comparison with many MOOCs, that are estimated at anywhere within £30,000 - £100,000.

### 1.2. Demographics

Over the duration of the course >9000 teachers registered, from 174 countries. At the start of the course 5891 had registered, of whom 3230 were active in the first week, and ~1000 in the final week

Activity in week 1 is a much better indicator of intention to study than 'registration', which is not equivalent to registration on a normal university course.

The course attracted the target audience, and even those who were not (FE, HE and researchers), are close to the field. As a CPD course for teachers, the education levels of the participants were high: 89% have degrees, although this is not very much higher than the Coursera average of ~80%.

### 1.3. Evaluation

The course received the resounding appreciation of the respondents, with a 99% rating of excellent, very good or good, and a significant improvement in participants' understanding of ICT in primary education. Among completers there is a strong appetite for a follow-on course.

All the forum post comments on the value of the course were highly appreciative.

54% of registrants had not previously heard of the Institute of Education, i.e. 4800 people who were all a relevant population for IOE marketing. However, it is important to note that the compliments on the course in the forums are to 'Coursera', rather than the partner providers.

The financial return to partner institutions is ~£5 per certificate for the participants who paid, generating an income of £788 to IOE, against the £9000 staff costs. The income is commensurate with the cost of TAs to monitor the forums, but not with the preparation costs. This means that later runs could break even only if the preparation costs are seen as sunk costs, and at least as many are recruited to pay for the certificate.

The overall experience of both course team and participants on this CPD course was overwhelmingly positive. It has proved to be a true experience of the co-construction of knowledge, as such courses should be.

#### 1.4. Lessons learned

To ensure better completion rates it would be advisable to reduce the study time expectations for CPD courses from the 7-hour average of the completers to the 5-hour average of the starters, and not to aim for 10 hours per week.

Only those who did all four assignments were able to achieve a distinction. Of those active in Week 6, 27% gained a distinction and an additional 10% gained a pass, both towards the high end of the UoLIP MOOCs to date.

#### 1.5. Pedagogic value

The pedagogic principles were successful in terms of the excellent ratings, participants' evaluation of the significant increase in their understanding of the subject, and their wholly positive comments.

We were unable to achieve the optimal design for collaborative learning, given the constraints of the platform. Although participation in forums was unusually high overall, those that focused on the collaborative activities were rather less successful than those focused on discussion and debate.

However, the forums were a real success, with very high participation, and genuinely interactive conversations, rather than simple statements of a point of view, not linked to other contributions. Comments demonstrate the great value that participants put on the peer engagement in the course.

Participants do intend to use what they have learned within their schools. This is perhaps the most important outcome for the course. The main point was to enable teachers to "to contribute to the integration of a range of effective ICT-based practices and pedagogies" and the course has clearly achieved that (7.4).

Assignments were appropriately targeted for the population, as average marks were high throughout the course.

The provision of collaborative learning functionality on the MOOC platform is an urgent requirement, both the grouping function and the shared production activity.

#### 1.6. Financial value

The low cost of the preparation and support, estimated at ~£22,000, was judged appropriately for this course, in terms of its value to the participants. This was feasible because (a) as a professional development course the participants valued peer contributions and feedback very highly, and (b)

the study guide was focused on orchestrating this peer group work to enable the participants to benefit from their high-value peers.

Nonetheless, the value of the course to IOE and its partners is harder to assess. The fee income is too low for a viable business model, and so far we have been unable to put a financial value on brand recognition and marketing.



## 2. Introduction

### 2.1. Background

The origin of this MOOC was a project run by the UNESCO Institute for IT in Education, based in Moscow. The project was to promote the use of ICT in Primary Education, especially in those countries where this is uncommon.

The first stage was to produce a book using desk-based research: *Analytical Survey of ICT in Primary Education. Volume 1: Exploring the origins, settings and initiatives*, 2012. The second stage was to carry out a survey, with visits and interviews, of 32 leading primary schools in 19 countries, to illustrate to others what could be done: *Volume 2: Policy, Practices, and Recommendations*, 2014. The project was completed by an international team of 8 authors and researchers, from Canada, Chile, Hungary, Hong Kong, Russian Federation, Slovakia, UAE, and UK (Kalaš et al., 2014, 2012)

Books are valuable, but do not always penetrate to those who have greatest need of the insights and experiences of fellow teachers in the difficult task of innovating with learning technology. In addition, they could not adequately represent the wealth of video, interview, and case study material the team had gathered. For this reason the team of authors invited UNESO IITE and the Institute of Education to form a partnership to bring the work to a much wider audience by creating a MOOC on *ICT in Primary Education* in collaboration with the University of London International Programmes (UoLIP).

The MOOC ran for 6 weeks, May-July 2014, providing up to 10 hours study per week. It provided a Statement of Accomplishment at no cost, and a Verified Certificate of Attendance at \$49.

## 3. Approach to teaching and learning

### 3.1. Objectives

Once the project was agreed, the team agreed on a proposal to UoLIP. From the outset it was intended as a 'CPD course for primary education leaders, teachers and policymakers in all countries... in which participants are able to access up to date materials and resources, be guided in their own searches on the internet, and exchange ideas and experiences from their own institutional and national contexts'.

The partnership with UNESCO made Coursera's broad reach to a wide range of countries particularly important. The *Education For All* programme created a target of universal access to primary education by 2015. To achieve this, UNESCO predicted that 1,600,000 new teachers would be required by 2015, rising to 3,300,000 by 2030 (UNESCO, 2014). MOOCs may not be able to train all those teachers directly, but they may provide a way of training the people who could. Online CPD on the large scale could make an important contribution to achieving the ambitious target of universal education.

The course was also seen as a prospective marketing tool for existing courses. It related closely to modules run at the IOE in the department of Early Years and Primary Education, and benefitted from the advice of the academic leaders of the Primary PGCE, one of whom joined the MOOC team as a critical friend.



The course therefore began with the following intended learning outcomes:

1. The primary school teaching community to be able to contribute to the integration of a range of effective ICT-based practices and pedagogies.
2. School leaders to be able to develop, improve, and share the strategies and mechanisms that optimise the development of ICT-based teaching and learning in their school.
3. Policymakers and schools-related stakeholders, agencies and companies to be able to support head teachers and specialist staff in developing pedagogy-led and problem-led uses of ICT.

During the development of the course a fourth was added, due to the range of digital tools and resources being deployed:

4. For all participants a greater awareness of the range of pedagogic innovation that uses ICT, and the many free technology tools now available, to enhance primary education.

### 3.2. Teaching and learning methods

The standard MOOC pedagogy is to provide a mix of presentations, peer discussions, and automated assessment. This makes it possible to run courses on the very large scale, as they require only the fixed teaching costs of preparation, and none of the variable teaching costs of student support while the course is running. The format is a good fit with the pedagogy of the standard CPD course, which provides presentations to update participants on the latest research and developments, enables participants to work on this in peer groups, in which they derive great value from sharing experiences, ideas and expertise, and then to receive a non-assessed certificate of attendance.

The pedagogy of this CPD MOOC therefore followed the standard CPD format of curating resources and orchestrating peer collaboration.

Participants were invited to provide links to 'show-and-tell' case studies of their ICT-based pedagogies, and examples of technology tools and resources they used in their teaching, using external sites such as Padlet and Diigo. This enabled them to share and comment on each other's work in the discussion forums.

Through these activities, participants were able to make contacts and create professional connections, and learn about and discover technologies for their own use.

### 3.3. Assessment

In line with standard CPD design, there was no formal assessment. The automated assessment methods using quizzes were not appropriate for evaluating the qualitative descriptions and localised interpretations of theory that were the main outputs from participants. Peer assessment was the only form of assessment used.

Each assignment had a set of criteria, and once a participant had submitted their assignment they were sent up to 4 others to assess against the criteria, giving marks out of 10 and constructive feedback.

## 4. Design and development processes

### 4.1. Project structure

The MOOC team was the 8 researchers who had developed the two books on which it was based, with one member acting as lead instructor and chair of the course team, reporting to the Pro Director (Learning and International) at IOE and the Director of IITE<sup>1</sup>.

The team was supported by two further staff. a Technical Designer from IOE, with expertise in online learning and the Coursera platform, converted the team's design on the platform. A 'critical friend' from IOE with expertise in online learning and the Primary PGCE in the UK, worked through the final design for each week to provide an objective and constructive critique.

### 4.2. The design process

The process began 14 months prior to launch (L), when the final book was being completed:

L – 14: The team met for one day to debate and agree the outline curriculum for the 6 weeks. Each member of the team was responsible for one of the weeks, in some cases doubling up.

L – 12: The next task was for the books editor to select and map the material in the books to match each week of the course.

L – 11: On this basis the lead instructor drafted the proposal, using the Coursera template, for comment and editing by the rest of the team.

Thereafter the team kept to the standard Coursera schedule for the launch at the end of May 2014.

With 8 members all in different countries and time zones, there were few opportunities for collaboration, so we had 2 Skype meetings to discuss and agree overall planning and scheduling, took advantage of members' international travel for occasional small group meetings, and used 1-1 Skype meetings between the lead instructor and other members to fine tune designs.

The team used a shared Googledoc to plan the teaching-learning activities. The overall pedagogic approach was designed for the first week by the lead instructor, which provided the model for the remaining weeks. Figure 1 shows an extract of how this was laid out.

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1. <sup>1</sup> UNESCO Institute of Information Technologies in Education, <http://iite.unesco.org/>

**Section 1.4: Supporting teachers and leaders**

**Activity 1.4.1 (Optional)**  
80 mins  
In the schools survey we asked about the lessons they learned about the process of integrating ICT, and how they would do it differently now. The strongest responses were about how best to support the people who are responsible for the process: both leaders and teachers. There were similar responses from a recent survey in EU countries, which also echoed the Becta studies from some years earlier.  
**Read** the document *ICT in Education Survey Summary*, and compare these findings with those in the studies in Activity 1.3.4.

**Activity 1.4.2 (Core)**  
30 mins  
**Assess** your priorities for teachers' and leaders' needs as they plan the integration of ICT, using *ICT in Primary Education, Ch 1: Setting the Context*, Section 1.5 'The lessons learned'.  
**Record** them in your Course Journal in the 'Supporting teachers' section, for use in Activity 1.4.3.  
**Watch** the *audio-slide presentation on 'Action plans and policies for integrating ICT'*, noting the areas and issues that are of most interest to you.

**Activity 1.4.3 (Core)**  
30 mins  
**Read** through your Course Journal records from Activities 1.2.6, 1.3.2, and 1.4.2.  
**Contribute** to at least one of the following **Forums: Outline lesson ideas, Outline action plan**, so that we can begin building collective ideas and plans. Each Forum has initial headings under which you can make your contribution (up to 50 words per contribution). You

Figure 1: extract of Googledoc design, where resources are highlighted in red and activity tools in blue

Figure 2 shows how this appears once transferred to the Coursera platform, where the set-up was designed and implemented by the Technical Designer.

| WEEKLY STUDY GUIDES                               |  |
|---|--|
| 1: The 21st Century Primary School                |  |
| 2: How does ICT make a difference?                |  |
| 3: Pedagogical changes achievable through ICT     |  |
| 4: Technology opportunities                       |  |
| 5: Inspiring examples and implementation concerns |  |
| 6: Making ICT work                                |  |

| RESOURCES         |  |
|-------------------|--|
| Video Lectures    |  |
| Discussion Forums |  |
| Quizzes           |  |
| Peer Assessments  |  |
| Surveys           |  |

| 1.4 Supporting teachers' needs   |         |
|--|---------|
| Activity 1.4.1 (Optional)  | 80 mins |
| <p>In the schools survey we asked about the lessons they learned about the process of integrating ICT, and how they would do it differently now. The strongest responses were about how best to support the people who are responsible for the process: both leaders and teachers. There were similar responses from a recent survey in EU countries, which also echoed the Becta studies from some years earlier.</p> <p><b>Read</b> the document <i>ICT in Education Survey Summary</i>, and compare these findings with those in the studies in Activity 1.3.4. Have the issues changed in those 5 years?</p> |         |
| Activity 1.4.2 (Core)  | 30 mins |
| <p><b>Assess</b> your priorities for teachers' and leaders' needs as they plan the integration of ICT, using Section 1.5 'The lessons learned' from the document you downloaded in Activity 1.2.5, Chapter 1: Setting the Context.</p> <p><b>Record</b> them in your Course Journal in the 'Supporting teachers' section, for use in Activity 1.4.3.</p> <p><b>Watch</b> the <i>audio-slide presentation on 'Action plans and policies for integrating ICT'</i>, noting the areas and issues that are of most interest to you.</p>   |         |
| Activity 1.4.3 (Core)  | 30 mins |
| <p><b>Read</b> through your Course Journal records from Activities 1.2.6, 1.3.2, and 1.4.2.</p> <p><b>Contribute</b> to at least one of the following Forums: <i>Outline lesson ideas, Outline action plan, Policy plan</i>, so that we can begin building collective ideas and plans. Each Forum has initial threads under which you can make your contribution (up to 50 words per contribution), or you can add another thread yourself.</p>  |         |

Figure 2: extract of the Googledoc design after transfer to the Coursera platform and further editing

At this stage instructors had access to the site where they could edit the instructions, add further resources and forum activities, and edit the assignment instructions and rubrics.

### 4.3. Quality assurance

Once the design was complete at L-8 weeks, the critical friend worked through all activities and gave feedback to allow the final version of the first two weeks of the course to be ready for L-6 weeks, when it was assessed by the UoLIP MOOC Panel for final approval.

Minor adjustments were necessary throughout the course as participants raised difficulties with wording, or with access problems to some external sites.

### 4.4. MOOC structure and pedagogy

It was important that the pedagogic design principles employed for the course should reflect the nature of the participants, and the nature of the intended outcomes. We were aiming to reach teachers, head-teachers, and policymakers in the primary school sector, who were interested in using digital technology for educational improvement.

A course for ‘continuing professional development’ (CPD) has an audience who can benefit from each other’s knowledge and experience, in addition to the information, ideas and research evidence the team could provide. The approach therefore was to ‘orchestrate peer collaborative learning’ as well as ‘curate the key resources’.

The constraints on the MOOC structure were defined by the platform, and by Coursera’s request for a course that would provide 10 hours of study each week. The team took the view that 4 hours was the maximum that could be asked of teaching professionals, so we structured each week as 4 hours ‘Core’ and 6 hours ‘Optional’ activity.

To aid participants’ study and work planning, each activity was clearly labelled as core or optional, and stated the recommended study time to complete it.

The typical MOOC format for a week of study begins with an overview (in the Announcement) followed by lists of video lectures, quizzes, forums, and other resources for students to access as they choose. The team decided instead to design each week in the form of a clear Study Guide in the form of a sequence of resources and activities linked by tutorial text (see Figure 3).

**Watch** the video on **Learning Types** and try to identify the types of activities

**WEEK 3: Pedagogical changes achievable through ICT**

Learning with technology may happen through different types of activities. The literature offers various definitions and classifications of these types of learning

(For those having language difficulties or video access: [Transcript](#))


This video gives an example of the Learning Types introduced in Week 1, Activity 1.2.2., along with the 'definitions of types of learning', complemented by an audio-slide presentation on 'Types of learning and learning technologies' in the same activity of Week 1.

**Select** a few examples of ICT-based learning activities that you find interesting, making a note on each within your own Course Journal.

Activity 3.2.3 Different Learning Styles & types of activities (Optional) 40 mins

**Explore** the different categorisations of Learning Styles presented here, their characteristics and preferences for eLearning activities. Click on the tiny HTML buttons to explore the further layers of the mindmap and hover your mouse over the nodes to read the characteristics of each node.

**Learning Style Models**



**Sequences and orchestrates work with**

- resources and tools
- links to forums
- Core and Optional activities
- guides to duration
- building a Course Journal

**Select** a single learning activity using ICT that you have encountered so far, in either the course or your previous experience, and post it into the 'ICT activities suiting/challenging learning styles' Forum commenting how you think the activity would suit or, on the other hand challenge students to build competencies for a specific learning style. Try to select preferred learning activities that you yourself might wish to adapt within your own practice. Later on this week, you will be asked to develop a **Learning Object** for a preferred theme using ICT tools yourself and this might give you a good start.

[Admin Help](#)

Figure 3: Showing some of the key features of the pedagogic style

This enabled the team to clarify the relationship between the different resources, and to promote engagement with them by, for example, proposing a discussion around 'to what extent they could implement a teaching idea shown in a video', and 'how they would overcome the barriers within their own school'. Discussions in these 'issue-oriented' forums were generally very focused and practical, as a result, and had the characteristics of knowledge-building conversations, rather than being a series of unconnected viewpoints.

To ensure that participants would get full value from the course we suggested that they keep a Course Journal. For each activity the Study Guide would propose an entry to the Journal, e.g. if they had submitted an idea for assessing differential IT capability among their students, to record this in their Journal as a potential action to take forward; or for policymakers, to suggest they note a potential action at policy level for the kinds of issues emerging in the discussions.

Another way of helping participants to build on the value of the course was to use Assignments as a way of developing documents or resources for future. Participants had to complete four assignments. They were asked to

- create and describe a learning object,
- develop a 'technology decision' for their school or class,
- prepare a suggestion for tackling one of the key challenges identified in the literature, and
- design a two-page brochure or newsletter to inform policymakers about the issues of implementation.

In each case they could use within their assignment what they had produced during the course. The requirement to review the outputs of their peers was also an opportunity for them to use this experience to improve on their own outputs.

Providing a Study Guide, core and optional elements, and recommended timings, does not restrict how participants study. The course team takes responsibility for working out how participants will optimise the value of the course by recommending a default sequence of activities. They may ignore it completely, and use the resources as they would in any other MOOC, but the guide, if nothing else, forces the course team to think through an appropriate sequence of activity that engages participants as fully as possible in developing their use of learning technology on the basis of evidence and existing effective practice.

In summary the pedagogic principles governing the design of the course were:

- To curate the most useful evidence and resources for teachers, heads, and policymakers
- To orchestrate peer collaborative learning to build the teaching community knowledge of using digital technology
- To guide study planning by providing core and optional elements, and recommended timings
- To engage participants in making best use of learning technologies through guided activities, issue-oriented discussions, and both independent and collaborative learning
- To provide the tools and activities that enable participants to build their learning on the course into their working practices.

#### 4.5. Costs and workload

The budget for the MOOC was determined by the collaboration of the IOE with external experts. Principal costs were as follows:

- The host institution of the University of London contributes to the course provision by making no charge for its staff, estimated at £9600.
- The seven external experts were paid @£50 per hour for an estimated 30 hours of work to prepare and run their week (£8,950).
- Teaching assistants were paid at £20 per hour for 5 hours per week (£600)
- Professional costs for the 5-min promotional video were estimated at £1428.

The total costs for preparation and support are therefore estimated at £20,278. This is low in comparison with many MOOCs, that are estimated at anywhere within £30,000 - £100,000.

There were several ways in which costs were kept low for this course. It is useful to separate costs as follows:

##### **Fixed costs**

Preparation = 156 hours

Planning and admin = 63 hours

##### **Variable costs**

Support, monitoring = 38 hours

Here fixed costs are those that are the same, no matter what the cohort size, and variable costs are those that vary because of the per student costs of teaching support. The fixed costs were kept low as follows:

- Used the team's existing books as reading resources
- Used screencasts of audio over slides for informational videos

- Used the team's own videos of classrooms and students using technology
- Made use of resources and videos freely available on the web as illustration
- Only one professional video (5 mins) for promotional purposes

Variable costs were also kept very low. MOOCs are based on the idea that courses can be massive because they do not incur per student costs: support is given by peers and by automated feedback, which turns variable costs into fixed costs. We kept to this style in the way the course was run

- Allowed only 6 hours per week each for TA and each instructor to monitor forums and peer reviews
- Used peer evaluation of assignments (for 30% of the total score)
- Grades were based also on the number of contributions, peer reviews and forum posts

Instructors contributed mainly to the instructor-defined forums, and the General Enquiries and Discussion forum, while TAs would also monitor other forums and alert instructors to issues they could not deal with. Spot-checking of peer reviews was useful, to check for major discrepancies. In general the support time spent by instructors and TAs was as estimated, throughout the course, despite the usual attrition in amount of participation.

## 5. Demographic data on participants

The course was clearly advertised as CPD for teachers and education professionals, and indeed this was the audience it reached.

Over the duration of the course >9000 teachers registered, from 174 countries. The average registration on a Coursera course is ~11,000, so for a niche topic this was a reasonable number. At the start of the course 5891 had registered, of whom 3230 were active in the first week.

The pre-course survey had 1150 respondents, i.e. 36% of active participants, which is relatively high for such surveys. The demographic data it produced showed that the course reached its intended audience. The figures below show the comparative data between the pre-course survey for this MOOC and Coursera MOOCs in general (Coursera, 2014) .

Figure 4 shows the relatively low proportion from North America, possibly due to the terms in the title, which are in common use in UNESCO documents, whereas in the US 'primary' becomes 'K-6' and 'ICT' is rarely used.

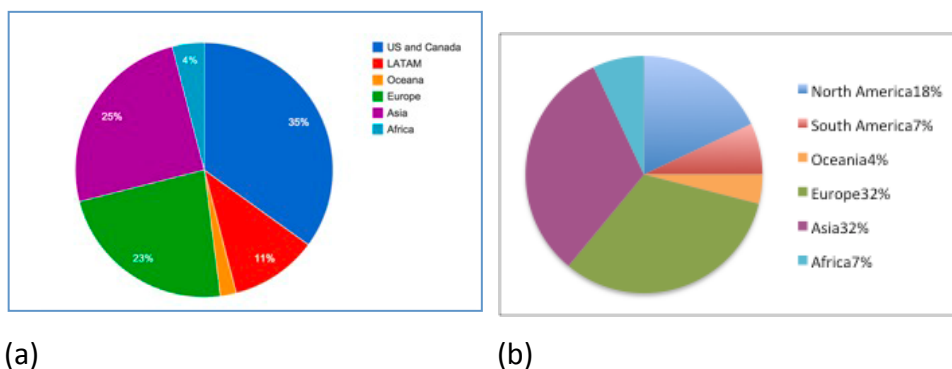




Figure 4: (a) Coursera and (b) IOE data, showing a lower proportion from N America

Figure 5 shows that it certainly attracted the target audience, and even those who were not, FE, HE and researchers, are close to the field.

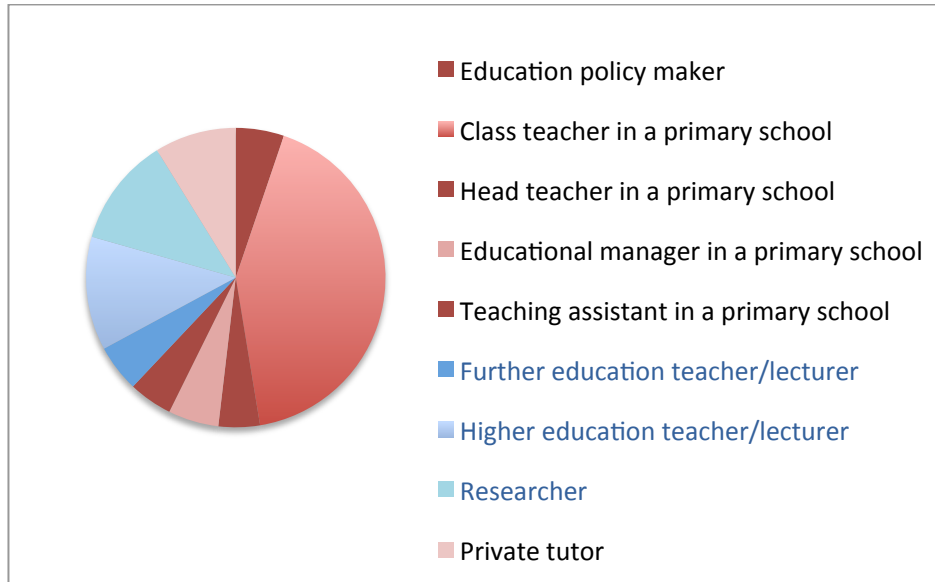


Figure 5: Showing that the course attracted the intended audience

In terms of gender balance, 73% were female, in comparison with the average of 40%, clearly reflecting the balance in the primary teaching profession.

Given our aims of reaching into countries with poor access to primary education, it was also important that 44% were from emerging markets, compared with the average 37%.

As a CPD course for teachers, it was inevitable that the education levels of the participants would be high. However, at 89% with degrees, they were not very much higher than the Coursera average of ~80%.

## 6. Patterns of usage

The Coursera platform provides data analytics for every day of the course, so that it is possible to track patterns of registration and activity throughout.

### 6.1. Patterns of registration

Figure 6 shows that registration continued to climb from <6000 to >7000 in the first week and the rate then gradually plateaued, but continued beyond the end of the course, until Registration was closed<sup>2</sup>.

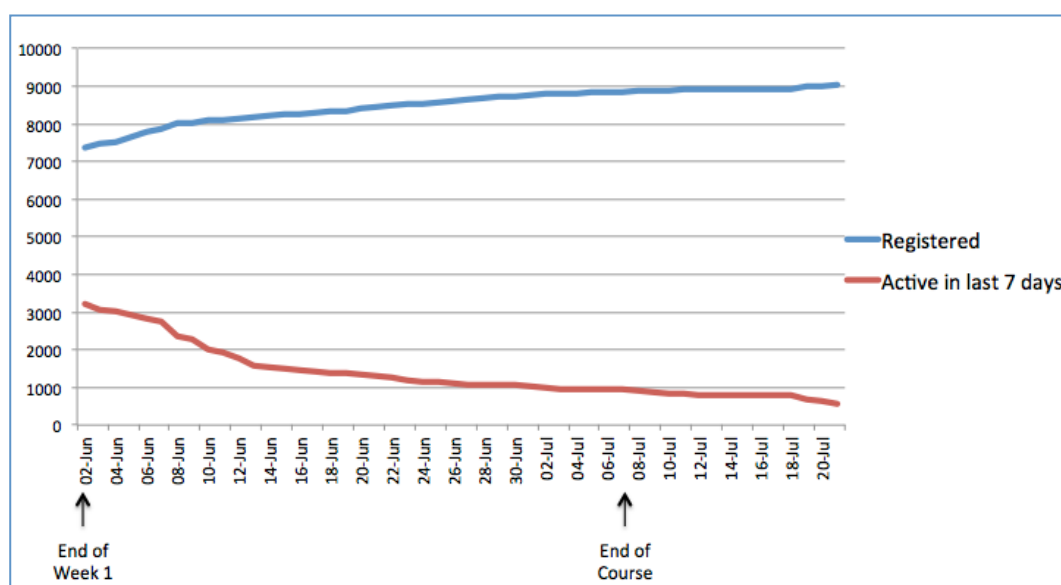


Figure 6: Registration and activity throughout the course

Figure 6 also tracks daily the activity on the course for each successive 7-day period. There is a steep drop-off in the first week from the 5891 participants who had registered at the start to the 3230 (55%) who had been active that week (according to User Admin). This is a good rate by comparison with other MOOCs; the UoLIP MOOCs in 2013 ranged between 32% and 50%. Thereafter the decline slows, helped by the continuing rise in registrations. After Week 3 it slows again.

In the end, 315 received a certificate of completion, 11% of those who started, and 950 (29%) were still active users.

At the start of the course, 2108 had been recorded as 'committed to complete'. During the course there was a substantial rise in the number committed to complete to 2729 by the end of the course, roughly in line with the increase in registration. However, peer review of assignments made it difficult for late arrivals to complete, so they would have benefitted from on-demand completion of assignments, as long as there are sufficient peers to do the reviews.

2. <sup>2</sup> Tracked daily via 'User Admin'

## 6.2. Patterns of activity

The number of participants active on the course was tracked daily and recorded as a % of those registered.

Figure 7 shows that registration is a poor indicator of intention to study, as only 55% began the course. However, given that registration takes such small effort, with no cost, this drop is not surprising. It is certainly not equivalent to registration on a degree course, and is more likely to be equivalent to 'enquiries', at best. Activity in Week 1 is a better indicator of intention to study. The pattern of activity shows a steady fall over the duration of the course.

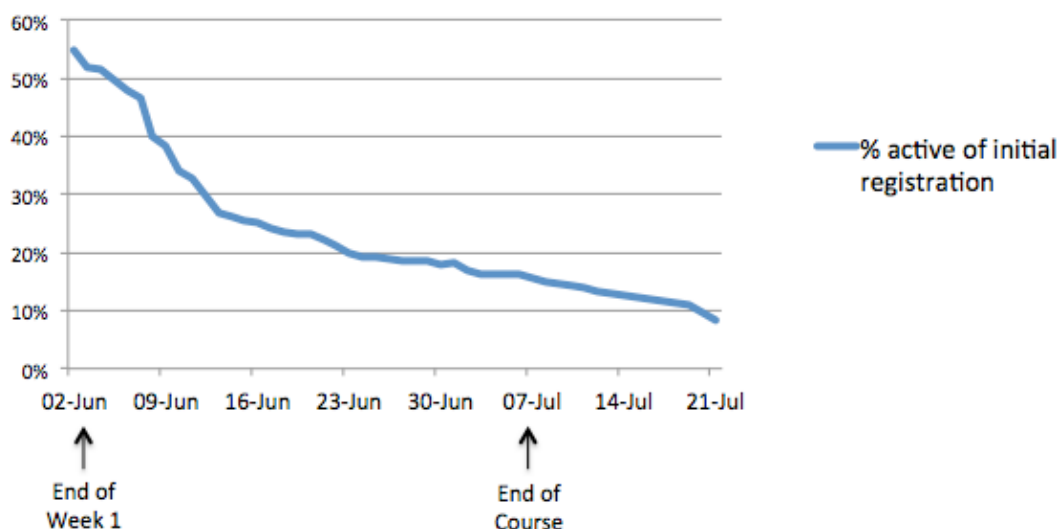


Figure 7: Number of active users each day as % of initial registration

Figure 7 also shows the continued activity after the end of the course, as participants caught up with activities and resources they were unable to complete earlier. By the end of the course there were ~1000 visitors during the week, with numbers still around a few hundred a month later, viewing lectures and browsing forums in equal numbers. Again this suggests the potential value of on-demand availability.

## 6.3. Progression and completion

To track the attrition over the duration of the course, we used the Coursera Dashboard, which counts as 'active users' all the unique visitors to the course during the week, as tracked by the Engagement section of the dashboard. It also counts the number who watched a video, and who browsed forums. These are given as percentages of active users for the week in Table 1.

A more rigorous definition of forum activity is to count the unique users who posted or sent comments to forums, and this is collected in Coursera's more detailed 'summary statistics', which says that a total of 1,952 unique users posted comments. The data on grades against user id shows a total of 11,216 posts and comments, of which 8,186 were to the pre-defined forums.

Table 1 shows the percentage of Week 2 active users who were making both comments and posts in forums<sup>3</sup>, rather than just browsing.

3. Defined by the 'forum combined unique' data point. Weekly data in Coursera's Summary stats is not perfectly aligned with Coursera Analytics

|                  | Week 2 | Week 6 |
|------------------|--------|--------|
| Active users     | 2740   | 964    |
| Watched a video  | 58%    | 33%    |
| Browsed forums   | 38%    | 42%    |
| Posted in forums | 21%    | 25%    |

Table 1: Activities of the active users in Week 1 and Week 6

One significant feature of this MOOC is evident here: the perseverance of the forum activity. It is an order of magnitude higher than is typical. The UoLIP MOOC report shows that in Week 1 there were 4-7% posting to forums and in Week 6 this had dropped to 2-3%, whereas in this MOOC it stays around 22% throughout all 6 weeks. This is discussed further in section 7.

Completion of a MOOC is inevitably low, given the severe attrition rate, and the number and proportion of passes (>60%) and distinctions (>85%) on this course is within the range of other UoLIP MOOCs (though pass rate and distinction criteria vary a lot). Similarly, the completion rate of 37% is within the wide range of 25-40%. The completion statistics are shown in Table 2, using the User Admin definition of active users in last 7 days.

|  |     |
|--|-----|
| Pass                                   | 88  |
| Distinction                            | 227 |
| Total certificates                     | 315 |
| Completion against Week 1 active users | 11% |
| Completion against Week 6 active users | 37% |

Table 2: Completion statistics in relation to activity on the course

#### 6.4. Summary of patterns of activity

To summarise the findings on patterns of activity:

1. Drop-out was at a significantly lower rate after the first 3 weeks.
2. There was a 29% increase in the number committed to complete over the duration of the course, but with peer review of assignments it is difficult for them to catch up and complete by the end, so there would be a clear benefit in allowing later completion.
3. The substantial numbers visiting the course materials after the formal end of the course, open to registered participants only, is further evidence for the value of on-demand availability.
4. Forum activity was sustained at a relatively high level throughout the course, at around 22% of active users.

## 7. Measures of success

The main data available for judging the overall success of the course comes from the post-course survey, which tells us about the participants' experience and the potential marketing value of the course for UoLIP and for IOE. The assignment data - the scores and comments made by users - is an indication of the quality of performance, and the comments in forums are further data on both performance and experience.

### 7.1. Participants' experience

The post course survey was based on the standard survey questions, with some additional questions enabling us to compare which groups had been most active, and questions relating to the marketing value of the course.

The survey was sent to all registered students, and we received 174 responses (21% of week 6 active users). The results for overall experience and the perceived improvement in subject understanding are shown in Figure 8.

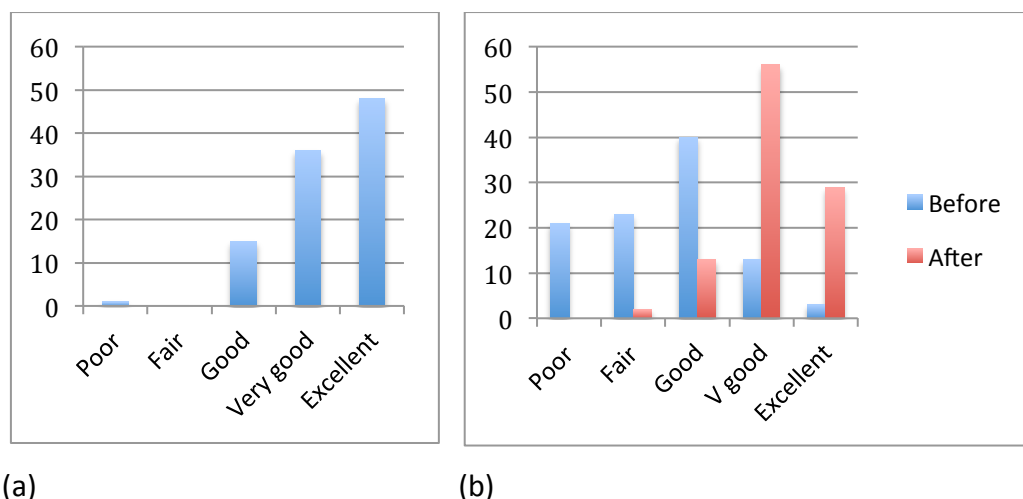


Figure 8: (a) Overall experience, and (b) Change in subject understanding

The course received the resounding appreciation of the respondents, with a pleasing (yet infuriating!) 99% rating of excellent, very good or good. Figure 8b shows one reason for this – there was a significant improvement in participants' understanding of ICT in primary education.

It seems to have broadly achieved the intended learning outcomes in terms of satisfying participants' own expectations, as Figure 9 shows.



Figure 9: Participants were asked to rate their agreement or not with the above statements.

The agree/strongly agree scores total more than 90% on every statement, and also reveal a strong appetite for a follow-on course.

Figure 10 shows the extent to which workload and the challenging nature of the course was more or less than expected.

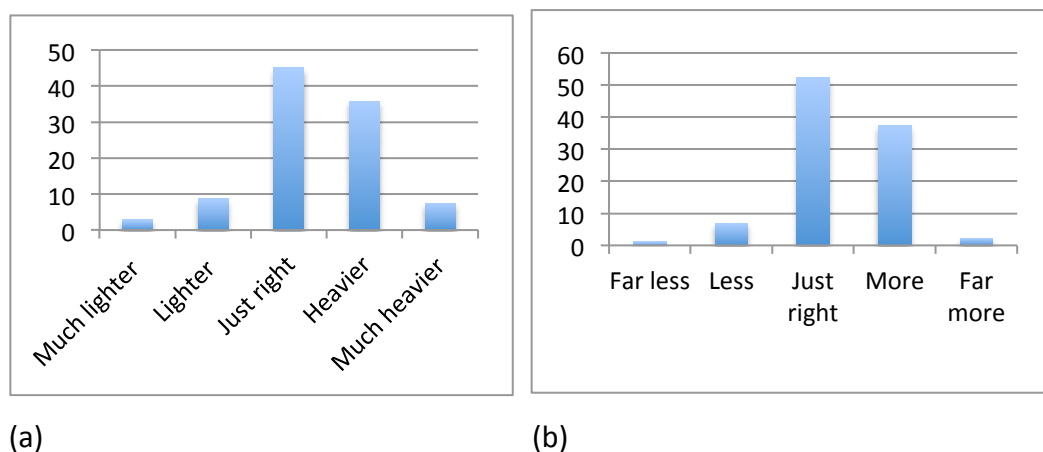


Figure 10: (a) Course workload in relation to what was expected; (b) how challenging it was in relation to what was expected

It seems that the workload and difficulty were pitched appropriately for these professional learners, though slightly on the challenging side. Pacing was also rated at 'just right' by 61%, with 29% rating is faster than expected.

Judging duration and workload is important for CPD courses, because professionals have very limited time. Although the duration of 6 weeks was rated as 'just right' by 69%, these, of course, were the completers. Nonetheless the largest proportion of respondents (36%) thought the optimal amount of study time was 5-7 hours per week. In the pre-course survey the largest proportion (46%) said they had 4-6 hours per week for study. Figure 11 shows that the population who did the pre-course survey had much less time capacity for study than the population who did the post-course survey.

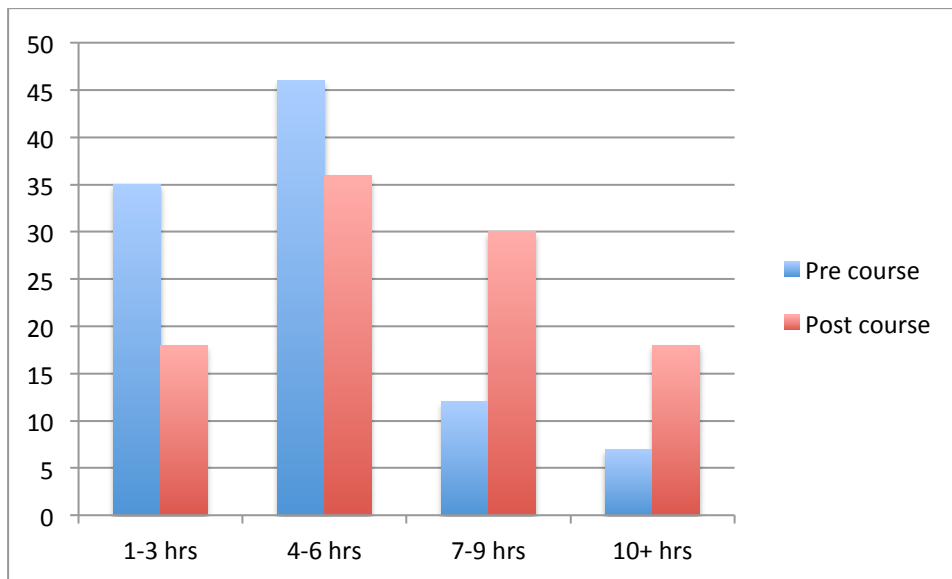


Figure 11: Preferences for study hours per week for pre course and post course respondents.

From this data we may conclude that to ensure better completion rates it would be advisable to reduce the study time expectations for CPD courses from the 7-hour average of the completers to the 5-hour average of the starters, and not to aim for the 10 hours that we were asked to provide.

The course was targeted at teachers, headteachers and policymakers, and as Figure 5 showed, these were the dominant groups in the participants. We were interested to know which groups were most likely to complete, so Figure 12 shows the % of each group in the pre-course survey that completes the post-course survey. It shows that those most likely to complete are the higher status policymakers, managers and FE lecturers, while only 20% of the class teachers make it to the end.

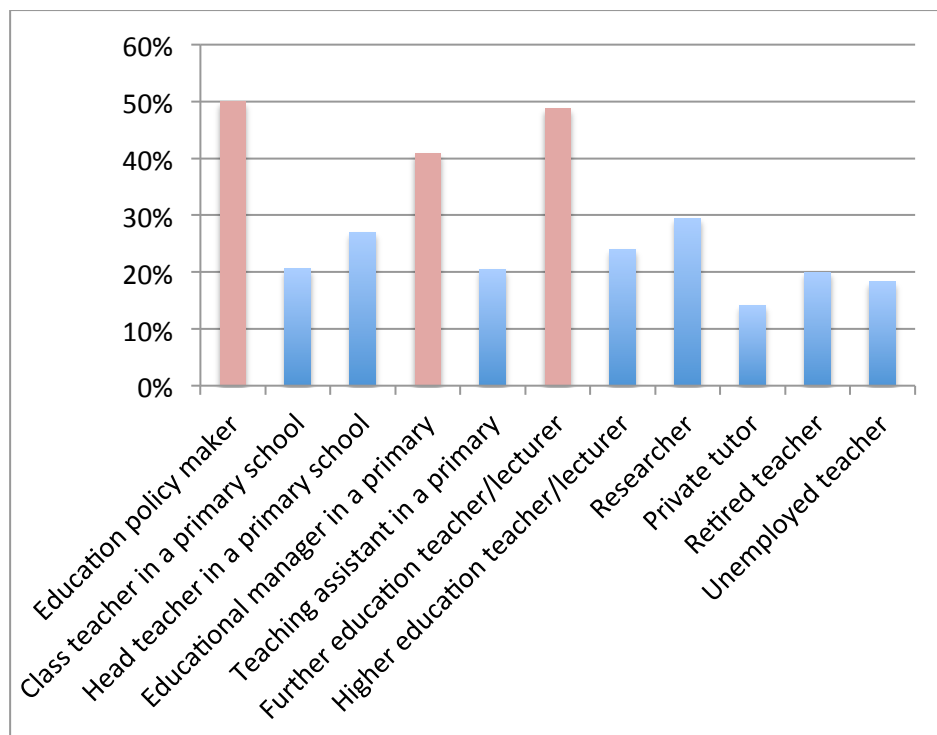




Figure 12: The % of post-course to pre-course survey populations for different employment groups shows the higher status groups (red) are more likely to finish

## 7.2. Use of forums

There were two types of forum, those that proposed discussions targeted on specific issues, or interpretations of videos and other resources, and those that proposed discussions relating to participants' outputs, such as lesson plans, or case studies.

The latter were not collaborative activities, because the platform does not lend itself easily to collaboration. We could not ask participants to work together to produce an agreed joint output, such as a learning object for some specified learning outcome. There is no provision for this kind of activity in the MOOC platform. It is not possible to set up small groupings of students, and there is no functionality for developing a shared product.

The forum activity is very appropriate for discussing issues and interpretations, but does not link to any shared production environment, even something as simple as a Googledoc. The closest we could get to this was to use peer resource exchange environments such as Diigo, and Scoop-It, and link these to a forum.

Comparing the popularity of forums, we can see from Figure 13 that the latter approach fails as a collaborative learning substitute, in the sense that the forums linked to participant-generated outputs (plans, case studies, concept maps, designs, etc.) were generally less popular than those linked to issues, ideas and interpretations.

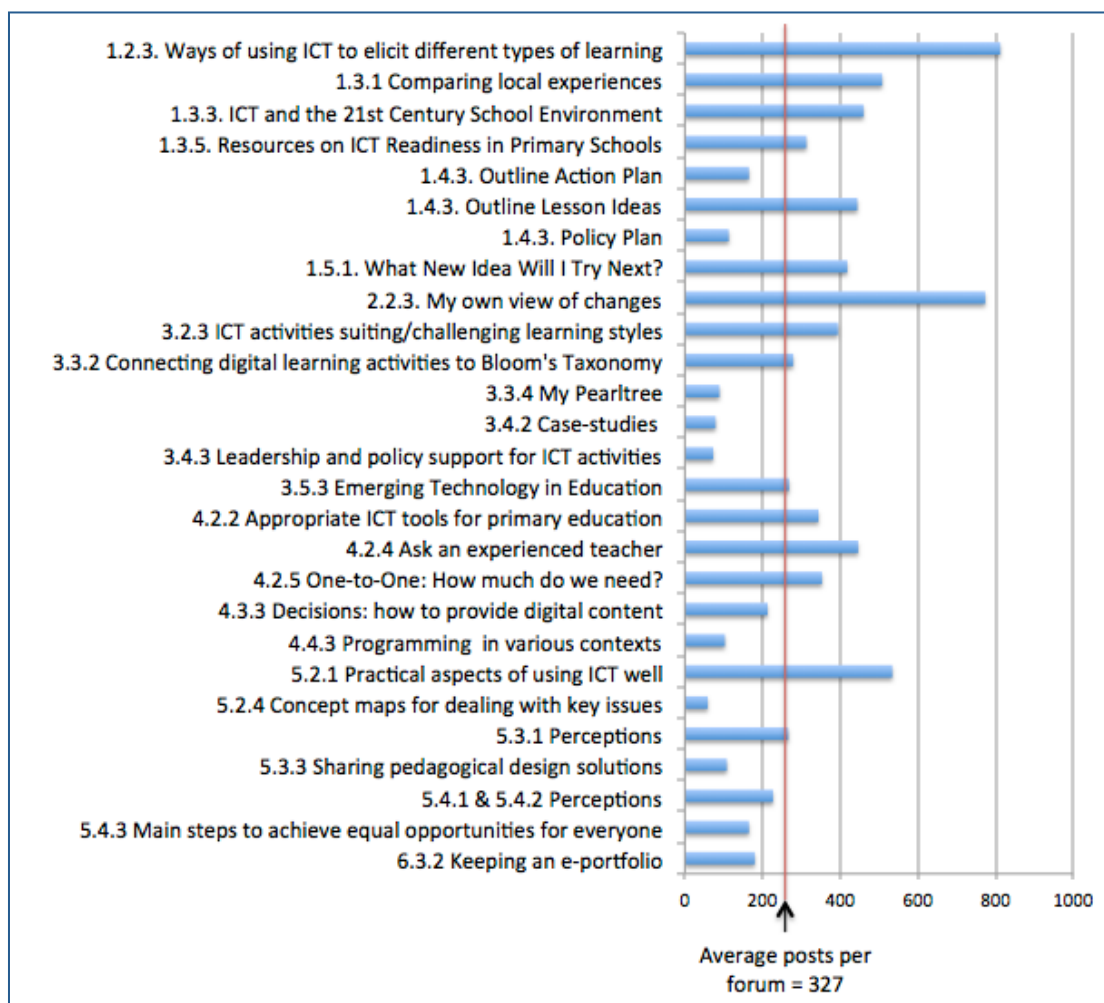


Figure 13: The relative popularity of different forum topics

The average number of posts, 327 per forum, was still high, given the number of participants (on average ~2000 over the duration of the course). But it remains difficult in this environment to engage participants fully in collaborative learning activities that put the concepts and theory into practice. This is an important area for future MOOC pedagogy development.

The high rate of forum participation in this CPD MOOC shows an interesting contrast with the pattern of participation in the other UoLIP generalist MOOCs. Figure 14 shows that although users watched videos at a similar rate, for the IOE's CPD MOOC the high level of participation in forums was maintained throughout the course at a much higher level, with 'posting' at 26% and 'browsing' at 46% in the final week. There are several possible reasons for this, in decreasing order of likelihood:

- In comparison with a generalist MOOC, the cohort is a much more homogeneous group of peers, who have a lot to contribute to each other, and respect for each other's knowledge and experience
- There was credit for making at least 15 forum posts
- The study guide orchestrated collaboration through the use of 'issue-oriented' forums.

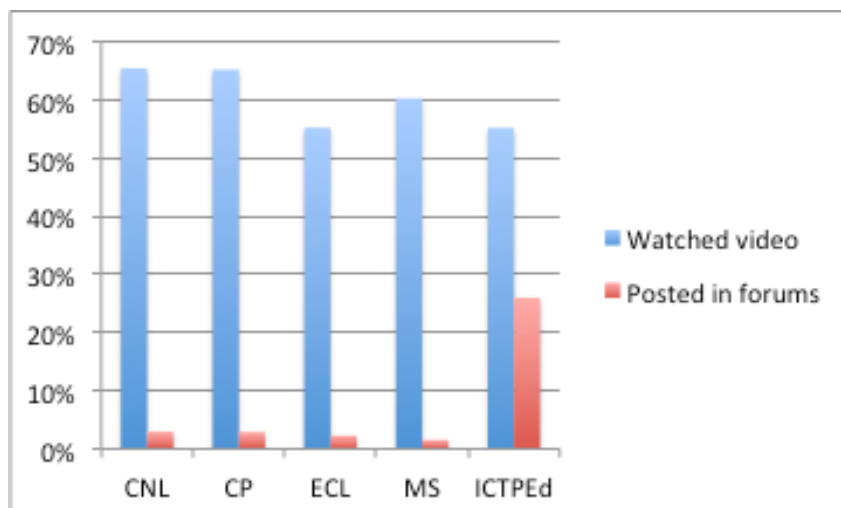


Figure 14: Video access was similar across the first five UoLIP MOOCs, but the ICT in Primary Education MOOC showed a significant difference in the forum activity

### 7.3. Assignment data and assessment

There were 4 peer-reviewed assignments during weeks 3-6, and altogether 1377 were submitted, generating 4247 peer reviews, approximately 3 each. Pass levels were set following advice from Coursera:

- The pass level is 60/100.
- The threshold for a distinction is 85/100.

The final participation points were calculated from:

- Number of submitted contributions (20% for 4 in total)
- Number of peer reviews done (30% for 8 in total)
- Peer feedback scores (30%, based on scores for each of 4)
- Forum contributions across the course (20% for 15 in total).

Only those who did all four assignments were able to achieve a distinction. Average scores for weeks 3 to 6 were 68%, 75%, 79%, and 79% respectively. The slightly weaker participants were dropping out, perhaps, but the range is not very wide.

Of those active in Week 6, 27% gained a distinction and an additional 10% gained a pass, both towards the high end of the UoLIP MOOCs to date.

### 7.4. Comments in forums

One way to judge the participants' experience of the course is to inspect the comments in forums. These were primarily content-oriented, but one forum at the end was set up by the course team to say 'Au Revoir'. This attracted 145 posts, and we could not find one that was other than highly appreciative. The first 8 comments on the participant-generated thread 'Thank you!!' are:

- I wanted to express my highest gratitude to the Coursera Team for providing us this opportunity of learning. I can't express enough, how much I've gained from this course. Past six weeks were filled with enriched learning materials, great resources, reading articles, and

peer discussion forums. I can't wait to go back and share all this with my co-workers. I was asked to do a presentation of my learning for my colleagues. This will be the opportunity for me to convince my administration for providing Professional Development courses through Coursera.

- I subscribe to your words of gratitude. I'm six weeks studying the course. Try not to miss. It was not easy to overcome the language barrier! But I am very happy! Thanks to the organizers for your care and concern. Lots of interesting new materials. I am for the first time in such courses. Now I think I will frequently. Thank you fellow students! I read with interest the forum. Happy discoveries. All new creative successes. Prior to the new appointment on courses!
- I found this experience fully enriching...I must confess I had to struggle to find the time to meet the deadlines, but every task was engaging and mind-opening. Thanks for sharing your expertise.
- Thanks alot for organising such a nice course
- I also want to thank and congratulate the staff for all these ideas and useful materials. And thank you all my colleagues for sharing ideas with us.
- I would like to thank you, Coursera for the course. I also thank the other participants who made meaningful contributions. Our school is on the verge of 'stepping it up a notch', thanks to things learnt through this course. Merci beaucoup.
- Thank you for a wonderful learning experience. It has given me so many ideas, and insights into the transformations of learning taking place across the globe.
- What an awesome and learning experience here we had during these six weeks. The resources, the discussions and the knowledge we accumulated from this course is really unprecedented. I congratulate and thanks the Coursera Team for this course for successfully conducting this course and adding tons of new knowledge to our skill bag.

These comments are indicative of the general sentiments in all the comments in this forum. They are an expression of the hunger that professional teachers have for the support and encouragement they need if they are to make the most of the digital opportunities they feel must be possible.

### 7.5. Value to UoLIP, IOE and UNESCO

The value to the institutions that contributed to creating the MOOCs can be measured in three ways: brand recognition, additional students and fee income.

#### **Brand recognition**

We can estimate the additional exposure the registration process provides. The pre-course survey asked whether registrants had already heard of the University of London, the Institute of Education, and the UNESCO Institute of IT in Education. The percentage of respondents who had not were 30%, 54%, 62%. In relation to the 9000 teachers who registered over the duration of the course, these 3s translate to significant numbers: 2700, 4800, and 5600 relevant people, respectively.

However, it is important to note that the compliments on the course in the forums are to 'Coursera', rather than the partner providers. Will participants remember that it was an IOE course, or that it partnered with UNESCO IITE?

**Additional students**

The post survey asked if the respondent was interested in finding out more about relevant degree programmes or short courses from the University of London International Programmes or Institute of Education. Of the 174 respondents, 74% were interested in both, 55% in UoLIP and 29% in IOE.

**Fee income**

The financial return to partner institutions is calculated from the fee charged for a Signature Track Verified Certificate (\$49 in this case). 32% returns to UoLIP, of which 50% returns to IOE/UNESCO IITE. As all the external course team members were paid for their time from the UoLIP budget, and IOE contributed its staff time, the 16% of return to IOE was retained by IOE. This is approximately \$7.50 or £4.80 per certificate.

>200 participants signed up for the Certificate, but several had problems with the webcam authentication process. The actual number dropped to 165, generating an income of £788 to IOE, against the £9000 staff costs. It is commensurate with the cost of TAs to monitor the forums, but not with the preparation costs. This means that later runs could only break even if the preparation costs are seen as sunk costs.

## 8. Lessons learned

This section summarises the findings from the course development process, and from the course analytics, participant data, and evaluation surveys.

### 8.1. Course preparation and planning

The clear advance scheduling provided by Coursera is an appropriate and valuable planning tool.

The online collaboration worked well for the international course team, probably assisted by the fact that we had worked together before on the production of two books, involving some 3 or 4 team meetings.

To optimise the pedagogic design it is useful for the course team to

- Appoint a technical designer to develop the course team's design on the platform
- Assign responsibilities to each member of the team for the design of specific parts of the course
- Negotiate with the technical designer an agreed design structure to be shared across the weeks
- Use a collaborative design environment, set up according to the agreed design, where they can see and comment on each others' designs
- Learn how to edit their design once transferred to the MOOC platform.

### 8.2. Course support

The amount of support for participants during the course was relatively low. The course team and TAs spent ~12 hours a week contributing to forums and addressing urgent issues. The majority of these were technical, usually associated with webcam problems for Signature Track participants, and requests for deadlines to be relaxed. It was surprising that many of these professionals were very concerned to complete their assignments, even though this could be regarded as very low stakes assessment. For people in emerging economies especially, the certification provided by these courses for professionals does have value.

There was significant additional support for the course team from the UoLIP project manager, and from the Coursera project manager, who both gave unstinting help and advice throughout the course. This was invaluable, and reassuring to a course team who were all new to this environment.

### 8.3. MOOC pedagogy for CPD

The pedagogic principles listed at the end of section 4.4 were successful in terms of the excellent ratings, participants' evaluation of the significant increase in their understanding of the subject, and their wholly positive comments (7.1, 7.4).

The workload and pace were slightly too high. To ensure better completion rates, we should reduce the study time expectations for CPD courses to 5 hours per week (7.1)

We were unable to achieve the optimal design for collaborative learning, given the constraints of the platform. Although participation in forums was unusually high overall, those that focused on the collaborative activities, which had to be run on tools external to the platform, were rather less successful than forums focused on discussion and debate because the link was more tenuous (7.2).

However, the forums generally were a real success, with very high participation, and genuinely interactive conversations, rather than simple statements of a point of view that did not reference other contributions. Comments demonstrate that participants valued highly the peer engagement in the course (7.4).

It is also clear from the comments in forums that participants do intend to use what they have learned within their schools. This is perhaps the most important outcome for the course. The main point was to enable teachers to “to contribute to the integration of a range of effective ICT-based practices and pedagogies” and the course has clearly achieved that (7.4).

Assignments were appropriately targeted for the population, as average marks were high throughout the course (7.3).

The provision of collaborative learning functionality on the MOOC platform is an urgent requirement, both the grouping function and the shared production activity (7.2).

#### 8.4. Cost, income, and value

The low cost of the preparation and support, estimated at ~£22,000, was judged appropriately for this course, in terms of its value to the participants. This was feasible because (a) as a professional development course the participants valued peer contributions and feedback very highly, and (b) the study guide was focused on orchestrating this peer group work to enable the participants to benefit from their high-value peers.

The value of the course to IOE and its partners is harder to assess. The Signature Track income is almost insignificant, so on the basis of current certificate numbers and prices (7.5), it is entirely dependent on the reputational and marketing value it creates. For IOE it depends on the value put on the increase in name recognition for 5,600 people, and the increase of ~100 potential students recruited to IOE courses. The analysis we have done to check the profitability of our MA courses suggests that each additional student above the break-even level brings a profit of ~£1320 per MA. So if a MOOC costs £22,000, then we would need an additional ~17 students to offset that cost as a ‘marketing for recruitment’ cost. That would be an excellent conversion rate the 100 who express an interest, and much higher than many larger MOOCs have managed.

Given the early experience with the certification process, Coursera is changing its approach to how MOOCs are run. The changes and the impact on the IOE/UNESCO course are as follows.

##### **Courses are to be available on-demand**

On-demand would diminish the value of the cohort working together, which was a significant part of the course pedagogy. However the materials remain open to registered participants to continue using them. To maintain the value of peer review and collaboration it will be important to find ways of managing this process so that it continues to work even in the on-demand environment.

##### **A unified paid-for certificate**

This will replace the Statement of Accomplishment and the Verified Certificate, offered when a student is eligible. It should improve the take-up of the fee-paid certificate. However, we have asked for flexible pricing to assist participants from emerging economies. Coursera will offer flexible payment options.



### **Wider access to students through the use of a translating community**

This is very important, as it should improve the reach of a course to participants who cannot easily study in English. Only 5% of our participants responded that they had only basic English, and several helped each other with translations.

On balance, these are positive developments. One critical issue is whether the price of the unified certificate would impact on students from the emerging economies, and whether the technical difficulties of authentication they often encounter would prevent them from receiving a certificate. With a flexible pricing model, and a less problematic technical authentication process, these developments should help to increase both reach and revenue significantly.

## **8.5. Marketing**

High numbers of registrations are useful for the MOOC provider, no doubt, and for the university they may be useful for name recognition. But they should be seen as the equivalent of 'enquiries', not 'enrolment' in university courses. For MOOCs, a closer equivalent to enrolment is 'activity in week 1'.

To determine the marketing value of the MOOC we need actual recruitment data, by asking questions of new enquirers to IOE, and financial estimates of the marginal value of each additional student.

Poor marketing in the US reduced the registration there. This may also be due to the course title, whose terms were determined by those in use in the UNESCO focus countries, which are not those in normal use in the US.

The new deal that Coursera has brokered with the Obama administration in the US is to make teacher professional development MOOCs available with no charge for the certification for two years, and therefore no income to IOE from the US participants. The 'return' is that US districts will be invited to approve these courses for accreditation as 'continuing education credits', which should increase teacher take-up in the US. This is a high-risk strategy if it undermines the idea that online professional development courses should attract a fee. The expectation is that after the two years of free courses it will change the habits of teachers who will respond in future by paying for these courses. However, at present the consequence is that fee-paying undergraduates are subsidizing free education for highly qualified professionals, and we need ways of ameliorating that situation, rather than exacerbating it.

## **8.6. Interpreting the learning analytics**

The Coursera platform provides a wealth of data on engagement in different course activities every day throughout the course, and the pre and post course surveys allow useful comparisons to be made, as long as the right questions are posed before and after. However, the real value comes when we can interpret the data by looking at the within-subject relationships between, for example, activities and outcomes, or demographics and experience. This data is not yet available to us.

The forum discussions also provide large-scale data, but this is qualitative, and requires a further project to analyse this user-generated content in relation to the research questions we still have.

Assignments are a further source of qualitative data and indicate the extent to which the learning outcomes were achieved. This kind of course cannot be assessed automatically as yet, and we need more technical development to create learning analytics that will support this for non-scientific subjects.

## 9. Conclusion

Every MOOC enables us to improve our understanding of how to develop the field of online learning so that we fully exploit the capability of the technology. The particular conclusions we draw for the field in general are listed in the box below.

1. The certification provided by these courses for professionals does have value (8.2)
2. The provision of collaborative learning functionality on the MOOC platform is an urgent requirement, via both the grouping function and the shared production activity (7.2)
3. To maintain the value of peer review and collaboration within an on-demand environment it will be important to help academics continue orchestrating this process so that it continues to wor. (8.4)
4. We need flexible pricing to assist participants from emerging economies (8.4)
5. We need a less problematic technical authentication process to increase both reach and revenue significantly (8.4)
6. The term 'registration' is not equivalent to 'enrolment' in a normal university course; instead 'engagement in week 1' should be used as the only reasonable equivalent (8.5)
7. Fee-paying undergraduates are subsidizing free education for highly qualified professionals, and we need ways of ameliorating that situation (8.5)
8. We need further technical development to create learning analytics that will support automated or semi-automated assessment for non-scientific subjects (8.5)

The overall experience of both course team and participants on this CPD course was overwhelmingly positive. The course team had the opportunity to learn a lot more about online teaching and learning in this new environment, and also learned a great deal from the participants. Their contributions on the Padlet wall, the Diigo site, and Scoop-It, for example, will be valuable additional resources for later runs of the MOOC. It has proved to be a true experience of the co-construction of knowledge, as such courses should be.

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