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Understanding English Dictionaries: the Experience from a Massive Open Online Course

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Abstract

We report on the experience from the first Massive Open Online Course (MOOC) dedicated to English dictionaries. The course was created by Coventry University in partnership with The Alan Turing Institute and Macmillan Education, and was provided by the online learning platform FutureLearn. The course ran in late 2019 (with 2477 participants) and again in early 2020 (with 2287 participants). The course relies on a highly interactive approach to knowledge acquisition and consists of articles, videos, interviews, links to further readings, and surveys aimed at stimulating learners' active participation and interaction with the course content and with other participants. In this paper we reflect on our experience of running the course and interacting with participants, and we discuss the results of our quantitative and qualitative analysis of the MOOC. The analysis of the two editions of the course led to very similar results. We found that the majority of learners are female, with a university-level education, and work in the education and teaching sector. The course's participation was comparatively high, and the learners showed a good level of engagement, indicating that there is an interest in accessible courses on lexicographic practice.

Keywords: MOOC; massive online open course; data analysis; user data; lexicography; dictionary-making

1. The course

This paper reports on the experience from the first Massive Open Online Course (MOOC) dedicated to English dictionaries. The course runs on the *FutureLearn* platform[1] and is a collaboration between Coventry University, The Alan Turing Institute and Macmillan Education. It consists of six week-long units, each providing about four hours of study time. Materials are deliberately kept short (just a few paragraphs for written articles, just a few minutes for video recordings) and every piece of input is followed by at least one interactive task so that participants can construct their own meanings surrounding the information we present. On all *FutureLearn* courses, both qualitative and quantitative records of learner engagement are kept: learners voluntarily supply factual personal information at the start of the course, activity records are collected unobtrusively for each week of study, and we have more open-ended written evidence from learner responses to the tasks, and to the questions in the end-of-course survey.

The Massive Open Online Course (MOOC) concept originated in 2008 at the University of Manitoba, when a course on connectivism with only a few face-to-face students was offered online to everyone, at no charge. It immediately enrolled 1000s of additional learners from all over the world. The idea of offering free online courses was soon picked up by Stanford University, and then MIT. Both these institutions developed their own MOOC companies (*Coursera* and *edX*), while in the UK the Open University developed a rival company, *FutureLearn*. At least 70 million people have now studied with *Coursera*, *edX* or *FutureLearn,* and over 200 universities across the world offer MOOCs (MOOCLab, 2020). Of these, Delft University of Technology is at the top of the World University Rankings by MOOC Performance (WURMP), followed by the University of Pennsylvania and the University of Illinois. Coventry University was the 4th ranked institution on the WURMP 2020 list, and the only institution to offer an online course dedicated to dictionaries.

MOOC providers tend to share an educational philosophy rooted in connectivism, "a learning theory for the digital age" (Siemens 2005). The theory recognizes that in modern times fields of knowledge can expand very rapidly, but that they can also become obsolete very quickly. This means that learning has to be a life-long process, supported by technology and social networks, and that skills and knowledge acquired in the traditional way ("knowing how" and "knowing what") have to be supplemented by an understanding of where new information can be found when it is needed ("knowing where"). This approach to learning suits a dictionary MOOC exceptionally well, as reference works are "where" new knowledge is stored, and as such are an effective means of supporting lifelong learning. True to the spirit of connectivism, many participants on our course were habitual MOOC learners, committed to acquiring "how", "what" and "where" types of knowledge across a variety of fields of study. Our course introduces technology-enhanced information sources that are developing and changing before our very eyes, and participants have opportunities to engage with these resources and at some points even to contribute to their growth.

The MOOC is divided into teaching "Weeks", each covering one of the major themes we address in the course, such as "Why use Dictionaries?" (Week 1), the composition of a dictionary entry (Week 2), the evidence base for dictionaries (Week 3), the inclusion criteria for dictionaries (Week 4), ideas about meaning and definition (Week 5), and the future of

[1] https://www.futurelearn.com/courses/understanding-dictionaries

dictionaries (Week 6). Each Week typically begins by asking learners to think about, and share their thoughts on, a fundamental question relating to the theme of the Week. The idea is that they give their own "naive" views on these issues before they have been exposed to any teaching material. This is followed by tasks designed to tease out the complexities of the subject and to demonstrate the challenges lexicographers face – often by requiring learners to work with real language data. The next stage is typically a follow-up video and/or a short article to develop learners' understanding. Each Week ends with a summary of what has been covered, and participants are asked to reflect on what they have learned – and often to revisit the questions they were asked at the beginning of the Week.

Its first iteration of the MOOC ran from 16 September 2019 to 27 October 2019 and had 2477 enrolled participants. Due to its success, a second iteration of the course started on 20 January 2020, and a third began on 18 May 2020 to run until 26 June 2020.

In Creese et al. (2018), we described the background and motivation of the course, and the design of its very diverse content. The course aimed to introduce the world of English dictionaries to a broad, non-expert audience of language teachers, students and also language enthusiasts. One of our main motivations was to raise awareness of contemporary lexicography, and challenge common misconceptions about dictionary creation. A key feature is the continuous interaction among participants, and between participants and course educators and mentors. These discussions offered us an opportunity to learn a great deal about participants' expectations and opinions. In this paper, we reflect on our experience of running the course and interacting with participants, and we discuss the results of our quantitative and qualitative analysis of the first two iterations of the MOOC.

2. Quantitative analysis

This section reports on the quantitative analysis of the course, for which we focus on three main evidence sources: enrolment and engagement statistics, participants' demographics, and content from answers to surveys and comments on the platform.

2.1 Learners' participation and engagement

In its first iteration, the MOOC attracted 2477 participants. 1360 (or 55%) of them enrolled after the official start of the course, and only 11 (or 0.4%) of the 2477 participants unenrolled before the start of the course. In its second iteration, the MOOC attracted a slightly higher number of participants (2287), 1454 (or 64%) of them enrolled after the official start of the course, and only 12 (or 0.5%) of the 2287 participants unenrolled before the start of the course. These figures show that, even when they joined late, most learners (2466/2275)[2] stayed in the course until the end in both editions. The rest of our analysis will focus on these groups of participants who stayed in the course until the end. Although there is a wide variation in the length of enrolment (see Figure 1), in both editions of the course on average learners stayed enrolled for 50 and 45 days respectively, which is slightly longer than the duration of the course (42 days) and indicates a high level of interest in the MOOC.

Given the highly interactive nature of the course, we next looked at how active the learners were in participating in the different activities offered. 291 learners (12%) and 198 (9%), respectively in the first and second edition, achieved full participation, meaning that they completed at least 50% of the steps designed for the course. How does this figure compare with other MOOCs? A previous study on MOOC engagement, covering the period 2012-2016 (Chuang and Ho, 2016) reports slightly higher figures for a "typical MOOC", with 7999 enrolled learners and 1500 achieving full participation. This corresponds to 19% of all participants. However, a more recent study (Reich and Ruipérez-Valiente 2019), covering the years 2017 and 2018, reports a much lower rate, with 3.13% of participants completing their courses. This could indicate a general downward trend in MOOC participation, but it may simply reflect the paucity of evidence, thus far, on users' engagement with MOOCs. In any case, we can reasonably claim that our course had a good level of participation.

If we further look into the level of engagement, we can see to what extent participants viewed and/or downloaded the videos as the course progressed. As expected, we find a negative significant correlation between the number of views of a video and the video's position in the course:[3] the later in the course a video appeared, the fewer views and downloads it received. We did not, however, find a statistically significant correlation between the duration of a video and its popularity, measured in terms of number of views or downloads.

[2]In this and all subsequent analyses, the first figure we report refers to the first edition of the course, and the second figure (following "/") refers to the second edition of the course.

[3] The results of a Spearman correlation test between the number of views of videos and the step position are: correlation coefficient rho = -0.72, p-value < 0.01 for the first edition and correlation coefficient rho = -0.61, p-value < 0.01 for the second edition.

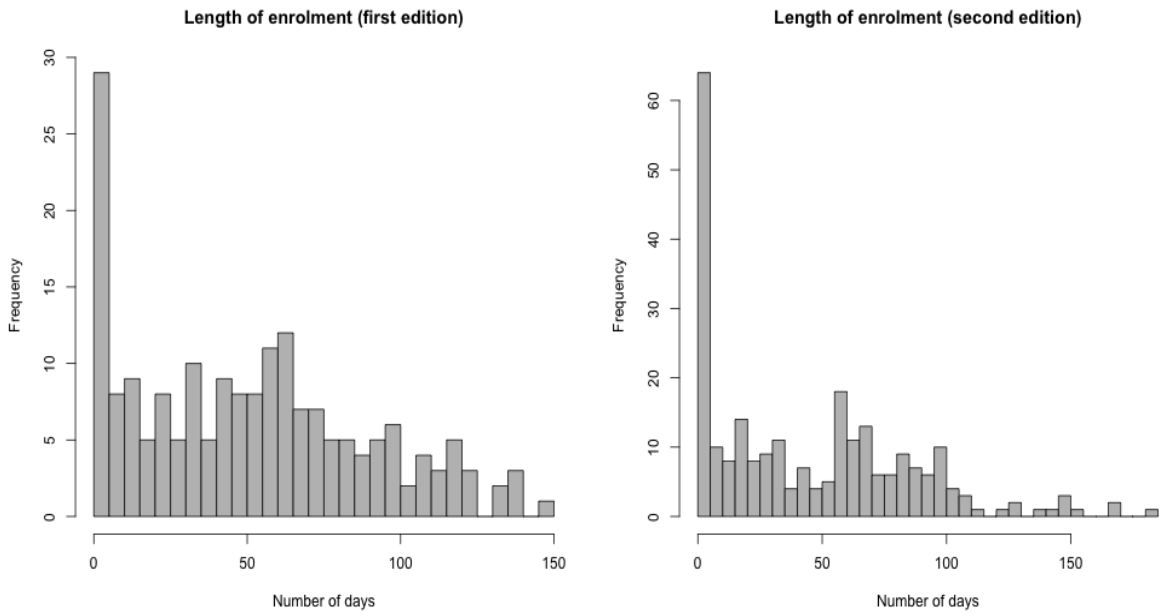

Figure 1: Histogram of the number of days participants stayed enrolled in the first edition (top) and second edition (bottom) of the course. The horizontal axis shows 5-day intervals and the vertical axis shows how many learners stayed enrolled for each of the intervals. For example, in the top figure, the first rectangle corresponds to the interval of 0-5 days and its height shows that 29 learners stayed enrolled for up to 5 days. This analysis is based on information about the dates on which the learners enrolled and unenrolled; the latter dates are available for 189 learners (first edition) and 250 learners (second edition).

2.2 Learners' demographics

The demographics of the learners were gathered based on their voluntary responses to questions at the point of signing up to the course, and this information is available for 19% and 16% of the learners (respectively in the first and second editions of the course). These data offer us important insights into the composition of the participants' cohort, their origin, gender, and education level, and allow us to compare them with the expectations we had on the background of the audience when we designed the course. Overall, we found that the majority of learners are female, have a university-level education, and work in the teaching and education sector.

Looking at the gender split, we find that females outnumber males by two to one (67% vs 33%, or 306 vs 150 in the first edition, and 61% vs 38%, or 225 vs 138 in the second edition).[4] This is in contrast with the gender composition of other MOOCs. Chuang and Ho (2016) report a two-to-one male-to-female ratio, but their data is skewed towards computer science courses, which typically attract more male learners.

Regarding the learners' age groups, we have usable information regarding 435 (or 17.6%) of the learners of the first edition and 343 (or 15%) of the learners of the second edition. The data show a relatively even distribution, with an average of 41 years (first edition) and 37 years (second edition), and a median of 36 years for both editions. A comparable proportion of learners (18%/16%) gave information about their education level and employment status, and we have details about the area of employment for 15/13% of the learners. The vast majority have a university degree (82%/79%), most are in employment (60/57%), and a majority (52/43%) are involved in teaching and education (see tables 1 and 2).

[4] It should be noted that in the first edition of the course 2 respondents declared their gender as "non-binary", and one as "Other", and in the second edition of the course 3 respondents responded "non-binary".

First edition			Second edition		
Education level	Count	%	Education level	Count	%
university_degree	194	43	university_degree	154	43
university_masters	148	32	university_masters	100	28
secondary	34	7	secondary	38	10
university_doctorate	32	7	university_doctorate	30	8
tertiary	30	7	tertiary	19	5
professional	13	3	professional	14	4
less_than_secondary	4	1	less_than_secondary	6	2
apprenticeship	1	0			

Table 1: Education level declared by the participants in the first (left) and second (right) edition of the course.

First edition			Second edition		
Employment status	Count	%	Employment status	Count	%
working	264	60	working	203	57
unemployed	82	19	unemployed	84	23
retired	62	14	full_time_student	36	10
full_time_student	32	7	retired	34	10

Table 2: Employment status declared by the participants in the first (left) and second (right) edition of the course.

According to the information provided about the learners' country of origin (available for 67%/58% of the participants), most came from either Europe or Asia (51/25% and 43/31% respectively, see table 3). The most frequent country of origin was Great Britain (19/18% of respondents), which is in line with the over-representation of developed countries found in previous studies (Chuang and Hu 2016). These figures may not be entirely accurate, however, as some Asian participants accessed the course via a virtual private network (VPN) and did not reveal their geographical location.

The preponderance of British participants was probably a reflection of the fact that the course was created in the UK on a British MOOC platform (*FutureLearn*). This may also explain the higher level of active participation observed for participants from Europe[5] and North America: we found that 49/48% and 53/50% (respectively) of all joiners (i.e. those registered for the course and who have given information about their country of origin) from these regions were considered "active learners", meaning that they marked at least one step as complete in the course (see table 3).

Continent	First edition			Second edition		
	Joiners	Active learners	% of active learners	Joiners	Active learners	% of active learners
Africa	79 (5%)	24	30	169 (13%)	34	20
Asia	408 (25%)	137	34	416 (31%)	119	29
Australia	38 (2%)	18	47	25 (2%)	5	20
Europe	834 (51%)	407	49	572 (43%)	274	48
North America	75 (5%)	40	53	38 (3%)	19	50
South America	108 (7%)	49	45	38 (3%)	14	37
unknown	100 (6%)	47	47	73 (5%)	24	33

Table 3: Continent of origin and level of engagement of the participants by continent in the first (left hand side of the table) and second

[5] We only have data about continent provenance for a subset of the course participants. Moreover, the data on active participation at our disposal do not differentiate between the countries within each continent, but we know that participants from Britain constituted a large part of the learners. We conjecture that the high figures of active participation in Europe are to a large extent explained by the participation in the UK. Further analysis would be needed to confirm this.

(right hand side of the table) edition of the course by continent, measured in terms of number of joiners (those who registered in the course), number of active learners (those who marked at least one step as complete in the course), and proportion of active learners (those who marked at least one step as complete in the course) over all learners. This analysis is based on a subset of the full dataset, because continent information is available for 67% (first edition) and 58% (second edition) of all learners.

2.3 Learners' responses

As well as being geographically diverse and representing all ages, learners came to the course with a wide range of pre-existing knowledge. While some had backgrounds in linguistics or language teaching, many others belonged to the category we refer to as "language enthusiasts". To some, concepts such as collocation or the receptive and productive use of dictionaries were entirely unfamiliar. To others, the information we provided about the evidence base of dictionaries was novel and unexpected, often overturning learners' preconceptions both about the lexicographic process and the breadth of information dictionaries contain. One learner began a comment with "Mind blown. I had no idea about…". For us as educators, these conversations with participants were always interesting and frequently instructive, providing valuable information about what users expect from their dictionaries and how successfully (or not) dictionaries meet users' needs.
Learners were encouraged to comment on the course activities and the first edition of the course had twice as many comments as the second edition (7959 vs 4108). There were no specific pedagogical interventions added to the second edition and we did not change the pedagogical approach from the first to the second edition, so this drop may be explained by differences in the cohorts of learners. As expected, in both editions the number of comments per week declined as the course progressed, with 3141/1826 comments in week 1 and 748/276 in week 6. Figure 2 contains a visualisation of the heavily skewed distribution of comments by week in the two editions of the course, and shows that the first week gathered a much higher number of comments compared to the other weeks.

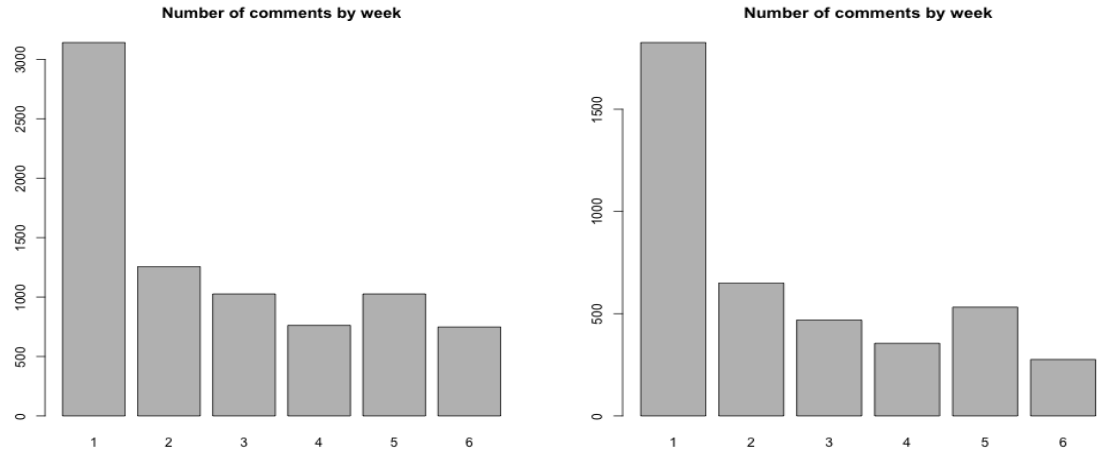

Figure 2: Number of comments per week in the first (top) and second (bottom) edition of the course.

An analysis of the course participants' responses to surveys reveals interesting insights. the majority of the cases (50/37%), the learners who left the course early and responded to the post-course survey offered to them declared that they did not have enough time, while 22/24% recognized that the course did not match their expectations, either because it was too easy, too hard, more time-consuming than expected, or did not match their goals (see table 4). We suspect that in many cases this was due to a misapprehension that the course would provide help with English language learning. Some participants who left comments early in the course had low levels of English and would have found it very difficult to understand the course content.

Reason	First edition		Second edition	
	Count	%	Count	%
I don't have enough time	51	50	45	37
I prefer not to say	10	10	11	9
My access to the course has expired	2	2	23	19
Other	16	16	15	12
The course required more time than I realised	4	4	7	6
The course was too easy	3	3	1	1
The course was too hard	2	2	4	3
The course wasn't what I expected	12	12	12	10
The course won't help me reach my goals	1	1	5	4

Table 4: Results of the survey after leaving the course. The participants were asked to give the reason for leaving the course.

The survey data show a good level of satisfaction with the course among those learners who stayed until the end. Of the learners who completed the course, the overwhelming majority (94/87%) said they acquired new skills or knowledge (see table 5).

Response to the question "Did you acquire new knowledge or skills in the course?"	First edition		Second edition	
	Count	%	Count	%
no response	2	2	1	2
no	3	3	2	3
yes	94	95	54	87
Not sure	0	0	5	8

Table 5: Results of the post-course survey question "to the question "Did you acquire new knowledge or skills in the course?", completed by those learners who completed the course.

Moreover, participants were sent specific surveys aimed at tracking their opinion of the course week by week. Only a small percentage of them (80 or 3% for the first edition and 71 or 3% for the second edition) responded and we cannot take this group as a representative sample of all participants. However, looking at the results of the weekly sentiment surveys for this limited group, we see that their sentiment was generally very positive, with an average of 2.8/2.9, where 1 corresponds to "unhappy" and 3 to "happy" (see figure 3). It should be noted that in the second edition of the course, nobody said they were "unhappy", which is a positive and encouraging result, showing some evidence of an improvement of the course over time.

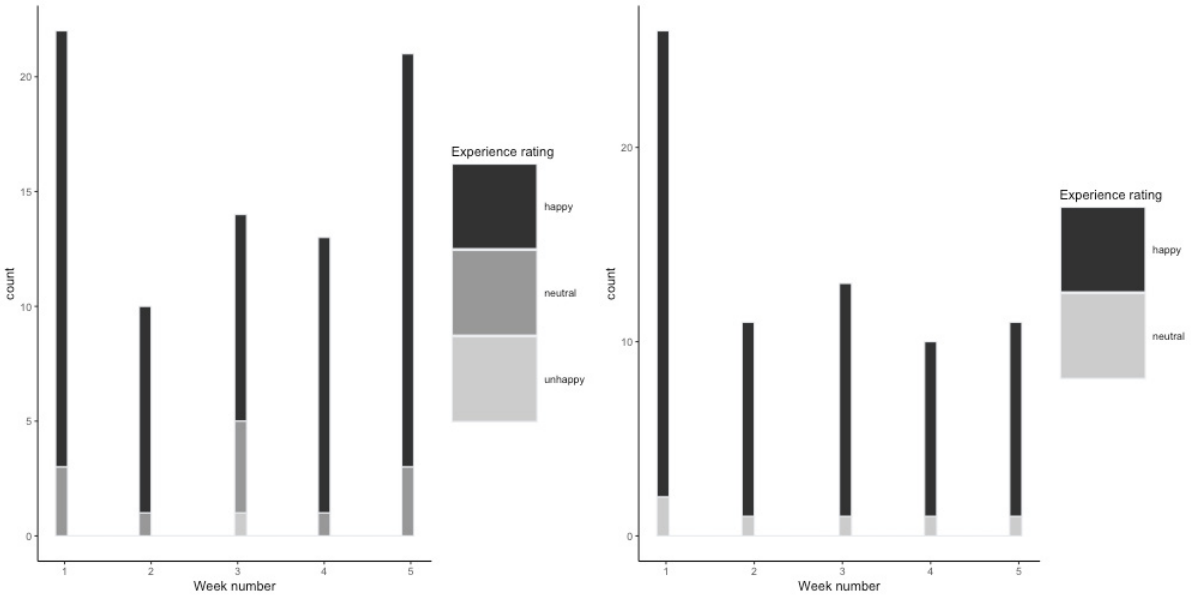

Figure 3: Visualization of the weekly sentiment of the learners in the first (top) and second (bottom) edition of the course. These data are available for 80 (first edition) and 71 (second edition) participants.

3. Some qualitative analysis

In this section we will give some examples of how the MOOC format works, and how learners responded to the content, taking examples from Weeks 2 and 5.

Week 2 ("What's in a Dictionary Entry") is structured around video clips of genuine dictionary users describing their own experiences and consultation purposes. It starts with a video of three such users trying to make sense of some of the information commonly found in dictionary entries, and asks a question that might be posed by a naive dictionary user: "Why can't dictionaries just tell us what a word means?" Although the video shows the three users struggling with codes and abbreviations, the majority of the learner responses to this video were in support of the use of grammar pattern codes and IPA, and the ensuing discussion tended to focus on form and denotation, as most learners were not used to considering issues of appropriacy to context, or distinguishing between receptive and productive use. For example a typical comment was "Shouldn't it be included the type of word, noun, verb, adj, adv etc. and its variations, countable, uncountable, regular verb or irregular, etc.? that's extremely useful when teaching", and "A further question of form should be how is this word conjugated or pluralised". This kind of information is, of course, important for language teachers and learners, but subsequent steps delved more deeply into what is involved in "knowing" a word, and how different aspects of word information might be conveyed in a dictionary entry. Learners were given a Design Task where they could propose additional information that might be added to selected words. Model answers suggested the addition of geographical and register restrictions (*charabanc, sidewalk, tort*) and notes on connotation or semantic prosody (*skinny, utterly*), but also the possibility of including images (for *pelvis*) or a sound file (for *bleat*). Links were provided to online dictionary pages for information about usage labels and word frequency, to *Sketch Engine* for frequency-based word lists, and to Brysbaert et al. (2018) for the concept of word prevalence. This all met with an enthusiastic response from learners, as the concepts were both new (to many) and relevant to their own practice. In keeping with our intention to introduce learners to as broad a range of English dictionaries as possible, learners were invited to examine entries in dictionaries they habitually used, and share and compare their findings. This staged process of reflecting, sharing and exploring illustrates the way the MOOC format can be a particularly powerful means of expanding learners' horizons, especially in the field of dictionaries where many adult learners start with quite fixed ideas, acquired in their schooldays.

Week 5 ("Meanings and Definitions") opens by asking learners to give their views on the question: "How do people (people in general – not linguists or lexicographers!) know what words mean?" This is a tough question, and it sparked a lively debate about how we communicate with one another, how we understand what other people say or write. In the first run of the MOOC alone, 79 participants shared their ideas on this topic. Context, real-world knowledge and "repeated exposure in a variety of settings" were mentioned by many, and others reflected on the different experiences of acquiring meanings in our own L1 and when we are learning a second language. One participant commented: "I think of myself as opening a file each time I encounter a new word. My brain adds all the information it can gather from context of use (including who said it and where) and I keep adding information to the file until I feel confident enough to use the word myself" –- a process which bears a remarkable resemblance to Michael Hoey's theory of Lexical Priming (Hoey 2005). Sometimes the discussion would veer into unexpected areas: in Week 5, for example, some participants noted the inbuilt redundancies in many forms of discourse, and this prompted questions about how far AI could successfully reproduce natural language. Throughout the course, the level of engagement with basic questions like these was always high (quantitatively – often

with over 100 responses), and the quality of learners' observations was often impressive and always instructive.
In a follow-up exercise early in Week 5, learners were confronted with some of the issues lexicographers face when creating an entry for a polysemous word. They were shown 10 corpus-derived sentences using the word *overwhelm*, and asked to assign each sentence to one of the numbered senses in a dictionary. For the most part, this was straightforward. But two or three of the sentences, as learners discovered, were more problematic. One of these read: "On their last day they were overwhelmed by farewell messages and gifts". Does this correspond to sense 1 in the dictionary, which emphasizes someone's emotional response ("to affect someone's emotions in a very powerful way")? Or to sense 2, which focuses on the notion of "overwhelming" quantities ("to exist in such great amounts that someone or something cannot deal with them")? As one learner observed "I sometimes had the feeling that a sentence could be reasonably assigned to more than one sense". In this way, participants came to recognise that dictionary senses are not set in stone (as many might have thought), but are to a degree a lexicographic construct which simply aims to provide some useful generalisations about the different ways this verb contributes to the meaning of an utterance. As many of them said, they had no difficulty understanding any of the sentences, so there was no ambiguity at that level. But mapping each sentence to a specific dictionary sense in the dictionary was not always so simple.
This message is then supported in a video interview with Patrick Hanks (which proved very popular: "I love the concept of meaning potentials!" said one learner) and by further tasks and a short article summarising the issues. From our point of view as educators on the course, it was always rewarding to see ideas like these – very familiar to those of us working in the field – gradually dawning on learners who had, in most cases, never given the matter much thought.
In our earlier paper (Creese et al. (2018)), we speculated that the content of the course "may challenge some participants' long-held views about the authority of dictionaries", and might correct popular misconceptions about how dictionaries are created. In this context, it is interesting to compare learners' responses at the beginning and end of each teaching Week – and indeed at the beginning and end of the course as a whole. Week 3, for example, begins with a video addressing the question "Where does the information in dictionaries come from?". This attracted over 100 comments in the first iteration alone. A minority of respondents had some awareness of corpora and their role in lexicography, but most had no clear answers to the question, giving the impression that this was something they had never really thought about. A recurrent assumption was that new dictionaries were mostly based on older ones, with comments such as:
"They probably get their info from past dictionaries, and update every year with a new batch of words", "They build on the previous knowledge and entries in an existing dictionary", "There is obviously a huge database from existing dictionaries but I have no idea how dictionaries originated 'once upon a time'".
Many responses were even more vague, with one learner suggesting that dictionary entries are "possibly sourced from the inputs of professionals like professors, lawyers, scientists, authors and journalists".
Week 3 then continues, through a mix of articles, tasks, videos, and other learning materials, in which different forms of linguistic evidence (introspection, citations, and corpora) are introduced, and learners have an opportunity to work with corpus data in the form of concordances and Word Sketches. At the end of Week 3 learners are asked to share their reflections on what they have learned. Again, this prompted a high number of comments, most of which demonstrated that many earlier assumptions had been overturned. Two typical responses were: "I understand dictionaries substantially better now than before. Exposure to corpus analysis was a wonderful experience… look forward to delving deeper."
This Week "changed my view not only on dictionaries but also on language as a whole."

4. Conclusion

Overall, the course provided valuable insights for lexicography researchers and practitioners, revealing the expectations and the topics of interest of an educated non-expert audience. This is succinctly summarized by one of the course participants, who commented:

> I have never imagined there was so much work behind dictionaries! I have learned about different dictionaries, different uses, the parts of a dictionary, the latest technology, their future... Now I see things more clearly and I appreciate dictionaries much more. It has been a fantastic trip.[6]

As we said at the beginning of this article, the course is currently in its third iteration and we will undoubtedly gain further insights into the participants' interest and attitude towards the world of lexicography. At the time of writing, MOOCs are experiencing a drastic increase in their popularity, in a time when a large part of the world's population is forced to stay at home due to the Covid-19 pandemic,[7] and it is reasonable to expect this trend to continue. With this analysis, we have provided the lexicographic community with a new source of evidence of public attitudes towards dictionaries, and we hope that this will be of inspiration in the design and maintenance of current and future dictionaries.

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