OLA! A scenario-based approach to enhance open learning through accessibility

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Abstract. Open Educational Resources (OER) and Massive Open Online Courses (MOOC) have not developed with an inherent capacity to attend to the needs of disabled students. In our research, we aim to understand the social, contextual and organisational issues behind these inadequacies. Through this, interventions and best practices can be developed to improve the situation.

Keywords: OER, MOOC, accessibility, disability

1 Introduction and related work

Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) offer new opportunities for learners who face limitations of cost, time or distance, entry requirements, or gender. However, this new educational paradigm has not developed with an inherent capacity to attend to the needs of disabled students [1]. This poses a serious problem to its foundation principles of being open to all. Accessibility in open online learning is particularly important since distance education in general attracts more disabled students than traditional education, and this trend is emphasised further in open education. For example Law, Perryman, & Law [2] indicate that while 12% of students of the Open University in the UK (OU) are disabled (8% in the rest of UK universities), 16 % of the users of open resources published by the OU (via iTunesU, YouTube and OpenLearn) declared a disability. Open Learning and Accessibility (OLA!) constitutes a strategic challenge for both the OU and the Universidad Nacional de Educación a Distancia (UNED), two of the largest universities in Europe. Both institutions are very active in the production of OER and MOOCs, and have a strong commitment to diversity and equality in education.

Recent research has revealed a lack of support for disabled students in open learning, in terms of poor compliance of platforms and contents with web accessibility standards [3, 4, 5, 6], lack of information about accessibility preferences of students, barriers of

e-commerce or biometric techniques, or of third party software or social networks, which are used as part of the learning activities.

Given the instability and innovation that characterises open online learning, we avoid a narrow conception of the relevant forms of learning. Our focus is therefore defined to be self-directed learning with open materials. This encompasses MOOCs, OERs, or other structures where the learner has little to no individual human support for their learning. This is in contrast to situations with expectations for individual support to make adjustments, access support services, and to tutor the student.

To advance support for disabled students in these situations, it is necessary to unpack the specific issues presented in the creation of accessible open learning, while at the same time, taking into account previous research on the accessibility of online and distance learning in general. For example, the EU4ALL project produced a comprehensive list of key requirements for supporting accessibility in further and higher education (HE), reported by Power, Petrie and Swallow [7].

In our research, we aim to understand the social, contextual and organisational issues behind these inadequacies, and how the requirements to support learners with disabilities in open learning differ from those devised for other learning situations. Through this, interventions and best practices can be developed to improve the situation. In this paper, we describe a process of engaging stakeholders with scenarios of e-learning originally developed for the EU4ALL project, leading us to revised scenarios to illustrate open online learning specifically, this highlights emerging themes that distinguish the accessibility issues which emerge specifically in open learning.

2   Methodology and materials

Understanding complex socio-technical processes, such as those involved in the creation of accessible open learning, is a challenge to which qualitative and design-based research methods are well suited, due to the 'wicked problems' faced, that cannot easily be reduced into components [8], and the socially-constructed nature of work, roles, and organisations. Scenarios [9] are a design-based research tool in which narratives of potential user interactions with systems become a basis for discussion with stakeholders, including the development of alternatives in which different events or systems impact upon proceedings. Through capturing and analysing qualitative data drawn from scenario-based interviews with a diverse group of stakeholders, we develop an understanding of key themes in creating accessible open learning. Through the interviews, descriptions of existing organisational approaches, potential best practices, and high-level requirements for accessible open learning are elicited.

The set of scenarios used as a starting point for this research was published in Rodriguez-Ascaso & Boticario [10]. These are an evolution of the scenarios produced within the EU4ALL project. The original scenarios were based on EU4ALL use cases, which were created in an extensive user requirements elicitation process, and were used at different stages of the project to illustrate how stakeholders interacted with the EU4ALL services. This encompasses students, who are supported to express their accessibility needs and their feedback through the system; lecturers, who are supported

in producing accessible materials, as well and in supervising course's accessibility against the needs of the registered cohort of students expressed by the cohort of students enrolled in it; disability officers who support students by assessing their needs, and serve as a liaison between students and other university professionals to remove accessibility barriers; transformation officers who work on the adaptation of materials, in coordination with lecturers, and librarians; librarians that manage the learning materials and their accessibility metadata in electronic repositories [11]. The scenarios also informed the process of designing the EU4ALL evaluation tasks to be undertaken at UNED's pilot site, where students and professionals made use of EU4ALL services. In total, more than one hundred users took part in these evaluations [12].

The EU4ALL scenarios then went through a process of adaptation, based in a review of open learning and accessibility literature, that identified common practices in open online learning platforms. The current scenarios we are using in our on-going research aim to illustrate 5 topics of open learning, namely:

1. The contexts in which students learn.
2. Their processes of finding and selecting open learning resources.
3. Administrative activities such as joining or paying for courses.
4. Processes of communication and collaboration during learning.
5. The content and activities included in courses, including assessments.

For example, scenarios 1, 2, and 3 are included below:

1. *After years away from formal education, and an increasing desire to change their current work and lifestyle, a person becomes interested in learning online. At home there is a personal computer (or tablet, or a mobile phone, or a combination of them), connected to the Internet, with one or more assistive technologies installed, such as a screen reader, a magnifier screen, a speech recognizer, a keyboard or mouse emulator, etc.*
2. *They begin by searching online for resources about the subject of their interest. This leads them to various MOOCs and OER provided by different universities, and hosted on different platforms. The available information on a particular course usually consists of a video and / or text with a summary of the objectives and learning activities, duration, date of commencement of the next edition of the course, comments by former students, etc.*
3. *Once a student has chosen a course, (s)he goes through the registration process. Within that process, the student is required to enter certain personal information into the system. Some courses may offer some kind of official recognition of the student's participation. The recognition process may include some kind of identity verification (e.g., webcam pictures, trial period, etc.). Acquiring certain certificates may require a previous payment via credit card, PayPal, etc. On completion, the university behind one of the MOOCs sends an email that suggests that she could sign up for the formal courses they offer. She is interested in this as a next step. Based on her experiences with the MOOC, she feels that she could now manage to study for a degree in the subject at this institution.*

Through semi-structured interviews based around these scenarios, conducted with the creators and users of open online learning, we elicit their perspectives on the roles,

expectations, and organisational processes in performing work to create accessible open online learning, and the barriers that lead to low levels of accessibility.

As a means to clarify whether the scenarios are relevant and accurate, we first ask participants to rewrite the scenario from their own perspective. When the participants are staff members, we then ask them if and how the scenario is relevant to their own job role, and whether they think there are ways in which this role could be refined to provide better support to the learner in this scenario. When interviewing learners, the questions instead discuss whether they could describe their own experience of such a situation and whether and how there is anything that could further satisfy their needs. This process is repeated for each of the five scenarios.

To conduct a collaborative process of thematic analysis, and produce a coding scheme for the interview data, the four members of the research team met to review all the notes taken from the conducted interviews, and created a structure of themes, through which responses could be assigned and the data can be summarised.

3   Findings

So far, 12 participants have contributed to our work: 2 x lecturers who are teaching subjects on accessibility of online learning, 2 x specialists on accessibility of online learning, 2 x consultants in online learning design and analytics, a disabled student, a disability officer, a specialist on the development of learning objects, a member of the technical staff of a centre offering MOOCs and OERs, a manager of a learning institutions, a manager of an open learning institution, and a producer of OERs, MOOCs and other forms of open online learning activity. All interviewees have studied or worked at the OU or UNED, and have previous experience with open learning.

3.1   Evolution of the Scenarios

The initial set of EU4ALL scenarios illustrated the accessibility aspects of online HE as implemented in the project's services. For instance, one of the scenarios described the initial interactions of David, a new student with low vision, with the UNED virtual learning environment (VLE). Within his registration process, he was asked to fill-in a questionnaire in the VLE about his preferences to access learning content and about the assistive products he may use in daily study activities. Also, this scenario described details about the assistive products and accommodations David used (i.e., Screen Magnifier and DAISY). Furthermore, the student was offered the possibility of being personally assessed by UNED professional experts in accessibility.

After the literature review, the EU4ALL scenarios were adapted to the open learning context of the OLA! Project. With regards to the scenario above, we did not find evidence of open learning platforms gathering accessibility preferences or needs of students at all. Also, it does not appear feasible for open learning institutions to offer professional and personalised assessment of students' accessibility needs. Hence, these two support resources were not included in scenarios used here.

Furthermore, we decided to avoid biasing the participant's response to the accessibility aspects of open learning, at least at the beginning of her/his response. Therefore, we eliminated most of the contents that were specific to accessibility (except for generic support products in scenario 1 "Student's context"). Should the interviewee not address accessibility at all, we would then ask her/him specifically about this topic.

As the scenarios were taken from EU4ALL and refined based on a literature review, it is pertinent to explore the responses of the interviewees in terms of how they find the scenario as realistic or valid for their own work. A highlight theme in responses was the variability of MOOCs and OER in terms of the pathways that learners are expected to take. Our original scenario 3 ("Administrative and e-commerce activities") mimicked formal procedures in HE, and expected that accreditation of the MOOC learning would be an important outcome, however this was queried: Low percentages of MOOC learners were actually taking up accreditation, and MOOCs were alternatively viewed by both organisations as a means to get learners interested in registering for formal, paid for courses. Thus an additional area for investigation raised by these responses is the way that MOOCs offer an effective way for students with disabilities to get a taster of formal learning, and how these can act to build confidence – particularly for learners who will appreciate and benefit from opportunities to check that they can learn effectively. In support of this role, it is questionable whether the platforms and activities used in open learning provide an authentic proxy for those of formal courses, even when the same institutions are involved. Interviewees expressed concerns in relation to this including a lack of information about the accessibility of specific learning activities, and the potential for bad experiences in open learning to damage wider confidence or interest in formal learning. This links to our discussion of student experience below.

3.2　Emerging themes

In this section, we provide a sample of themes emerging from the analysis of the interview data, which are specific to open learning.

Student experience. This is key in learning of all kinds, but given that in open learning the learner has limited individual institutional support, aspects such as interest, motivation, stress, coping strategies, and expectations emerged in the interviews in specific ways. For example, in response to scenario 2 (finding and selecting open resources) a blind student described how he reviewed course content and how compatible the course was with his own availability (duration, assignments), etc. When the interviewer noted that he was not addressing the accessibility topic at all, he replied "you are completely right, it is important to me but I never take it into account. I take for granted that courses are not accessible, but in case a course is attractive, I will enrol in it, and fend for myself, even if I needed to ask for help to people I live with". Next, the student reported stress when using the website and the elearning platform of an on-line institution, because of the accessibility problems that affected key activities, such as the registration process and the navigation through the course's contents. In some cases he needed to rely on someone else to sort these problems out.

Responsiveness. This theme was added to address institutional commitments to accessibility in open learning. At the beginning of our study, it was apparent that neither

open learning institutions, or the students making use of them, had established any mutual understanding of the expected levels of commitment to accessibility. However an OU manager noted that, by early 2015, advocates for the deaf filed federal lawsuits against Harvard and M.I.T., citing violations of antidiscrimination laws by failing to provide closed captioning [13]. This ended with a settlement of the Justice Department with EdX Inc. to make its website, course creation platform and mobile applications accessible under ADA, including WCAG 2.0 conformance within 18 months. This may influence other institutions and countries in terms of legislation and policy on the accessibility of open learning. It is clear that fixing accessibility issues requires the investment of institutional resources. A MOOC and OER producer stated: "During a MOOC course, we might receive 300 IT support requests, most of them about accessibility, navigation, awareness, how to get through, download, etc. The platform and its resources should be clearer for the students, but this would require more time, more resources, which are currently limited". A further avenue to improve responsiveness mentioned by interviewees was the potential to create communities around the open resources that could respond to accessibility needs.

Content re-use: Open learning materials are commonly licenced for remixing and re-use by others. This can involve adapting sub-sections of content, and combining content from different sources [14]. A consultant on online learning design and analytics noted that "there are more eBooks now, and some of them have a reuse policy. In case the staff in charge of a course want to use only a subsection of an eBook, they check that when it stands alone it is still understandable. Then, the targeted content is repackaged and made available through the course platform". The potential to reuse content is at the core of the open education movement. It has potential to improve accessibility by supporting anyone to adapt content, yet it also raises concerns that as parts of a resource are reused, prior work to make the content accessible could be lost.

4 Discussion

Although the accessibility of open learning have been sparsely addressed [15, 16], stakeholders taking part in our interviews confirm the importance of this issue in terms of learner experience, and of efficient provision of a high-quality service (e.g. dealing with large numbers of IT support requests). Accessibility should therefore be considered when evaluating services and in reference models of open learning.

As with other forms of computer-mediated learning, accessibility in open learning depends mainly on an institutional agenda of inclusiveness, rather than on the availability of any single technology. A suitable agenda would influence policies providing the appropriate planning, as well as the necessary human and material resources. However, we have identified challenges that are specific to open learning. These present new technical and organisational challenges:

With regards to the re-use of educational resources across platforms and networks, even if the original resources were produced with all the required accessibility features, is it possible to transport or adapt these features in a remixed resource "out-of-the-box"? The latter means that appropriate standards, technologies and procedures for handling

accessibility metadata for both the original and the re-used/re-mixed objects are in place within the platforms, which is not always the case [17].

It is also recognised that the forms of human support that provide responsiveness to accessibility issues in formal study are rarely provided for in open learning. Free or low-cost models in open learning are on the one hand an opportunity for widening access to education, but they often result in a lack of resources to support this access.

As open learning can be used to provide a taster of an institution or subject, or of online learning itself to a person with disabilities who may be interested in formal study, how is this experience reflective of relevant formal learning? Can well-designed open learning facilitate skills and confidence building, given the restrictions on human support mentioned above?

5 Conclusions and future work

In the present document we have described the process through which a set of scenarios are used to illustrate and explore issues of accessibility in open online learning, and to identify emerging themes that are specific to this context. The aim is to understand the issues behind the current inadequacies open learning has for disabled students, so that interventions and best practices can be developed.

The current sample has limitations in terms of the coverage of on only two HE institutions that share some similarities (e.g. a distance-learning approach and a focus on inclusivity). The organisational goals, processes, and roles of staff may differ for other providers of open learning. To date we have primarily explored the perceptions of staff, rather of than the learners themselves. The project continues, and our focus is now to interview a diverse sample of learners and to broaden the sample of staff to cover other open learning institutions. Furthermore, the scenario-based approach is useful to identify current challenges and practices, and naturally leads to envisaging and discussing potential solutions. The use of further participatory and user-centred design methods, combined with appropriate learning analytics techniques, will support a continued grounding of this research in the practices and needs of stakeholders.

Acknowledgement

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