YourMOOC4all: a MOOCs inclusive design and useful feedback research project

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Abstract— User feedback can be of great value for the development of guidelines to design MOOC platforms, courses, and open educational resources. Considering other learners' experiences may benefit the development of course recommender systems that consider not only the quality of the content but also the level of accessibility to address disabled learners needs. In this paper a novel design for a recommender website is introduced which collects user feedback requests for Massive Open Online Courses (MOOCs), offering the possibility to freely rate the taken courses following Universal Design for Learning (UDL) principles. The development of this website, which is currently in a pilot process by UNED, will gather valuable information directly from the learners themselves to improve aspects such as the educational quality, accessibility, and usability of this open learning environment advising about the missing means regarding inclusive design.

Keywords—MOOC, UDL, Accessibility, Inclusive design, Open learning

I. INTRODUCTION

Massive Open Online Courses have meant a significant change in online learning, making open education available to the public domain with an unimaginable supply, by offering learners the possibility of accessing university courses at a low cost. Although most people who sign up for MOOCs don't complete them, research shows that there are plenty of benefits for those who do. For instance, people of lower socioeconomic status and with less education are more likely to report benefits of MOOCs training and are taking particular advantage [1]. The findings support some of the early hopes that MOOCs would provide a life-changing opportunity for those who have limited access to education.

Therefore, the low cost and openness essence of MOOCs should facilitate learning for disabled learners. MOOCs reach global audiences, and it is necessary to consider all potential learners who might be left behind. Therefore adequate attention to diversity in education is constituted as a moral and social imperative [2]. But there has been limited research on MOOCs accessibility. Studies using a qualitative approach tend to apply to one group of disabilities. Those using quantitative methods analyse only one platform. Heuristic evaluations are simple technical reports that do not include learners in the reviews [3].

Regardless of its open character, access to the courses and their platforms can be an added difficulty; learners need to develop new specific skills [4, 5]. The establishment of interactive elements (test and quizzes) and audio-visual content in MOOCs adds challenges to the accessibility requirements [5]. Various techniques are employed to evaluate the accessibility of the web [6]. It is sensible to expect that these methods differ from each other regarding their validity, reliability, efficiency, and usefulness. But there is still a lack of research to date about the merits and disadvantages of the different techniques when evaluating accessibility [7, 8].

In the past, while performing accessibility evaluations of MOOC platforms and their courses [9]; we have noticed that some specific learning disabilities guidelines are tough to be examined in the accessibility evaluation considering the weakness of accessibility standards such as WCAG [1]. Unfortunately, there is a lack of references in the literature regarding disabled learners' expectations of what they would like to improve in MOOCs inclusive design [10].

Moreover, which courses to enrol among many electives is one of the most influential decisions learners have to take in their educational life. Those courses may bring different career or educational benefits. Although this selection is mostly thought to be trivial, the ambiguity of the factors to be considered leads learners to wrong decisions or missed chances. Recommender systems, applied in many domains, have recently been used in the educational context [11]. But we have observed that there is a critical point ignored in the course recommender systems while dealing with inclusive design and it is the lack of detailed information regarding accessibility to ensure disabled learners can access the e-learning platform and the content.

In this paper, we present a novel web-based approach which considers learners' experiences by aggregating all the feedbacks of the taken MOOCs. That feedback not only includes references to the quality of the content but also advises on the level and type of accessibility to meet learners' specific needs. We start with the rationale of the project, followed by the main characteristics of YourMOOC4All, to end up with conclusions and future work.

II. RELATED WORK AND RATIONALE

In MOOCs the learning is learner-centred, therefore requires a significant commitment to self-learning [12]. We need to scrutinise the learning design of MOOCs, information architecture, usability and the interaction itself, to understand if it is having a negative impact on the levels of participation and termination by the learners on these courses [13].

There exist several MOOC aggregator sites such as Class Central[2], MOOC List[3], and CourseTalk[4], in the first two you can add your comments related to the MOOC you have participated in. In the last one you can, as well, review different pedagogical aspects of the MOOC. Several studies have examined MOOCs feedback [14].

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[1]WCAG https://www.w3.org/WAI/intro/wcag
[2] Class Central https://www.class-central.com/
[3] MOOC List https://www.mooc-list.com/
[4] CourseTalk https://www.coursetalk.com/

Fig 1. YourMOOC4ALL search engine

Floratos et al. [15] in their study indicate the richness of information that can be extracted from CourseTalk, in this case about the feedback regarding motivation. There were collected responses from MOOCs reviewed at CourseTalk satisfying particular conditions: open access, offered by top-rated Universities, and have received a high number of reviews. Authors provide guidelines concerning modes of formative assessment and feedback practices to promote engagement in MOOCs.

Another study made by CourseTalk reviews feedback on online education [16]. In this case, the investigation was centred on more than 46 providers, 7000 courses, and 74000 reviews. Some of the main conclusions indicate why aggregators' websites can be useful for the learners, allowing them to freely judge their expectations and how that can help to design courses. As well, conclusions outline the design of MOOCs, considering the enhancement of usability can improve the user experience, putting the focus on MOOC providers.

The solution proposed is to use the formative framework of UDL. UDL favours the elimination of physical, sensory, affective and cognitive barriers to access, learning and participation of learners [17]. The goal of the UDL is to use various teaching methods to remove barriers to learning and give all learners the same opportunity to achieve their learning goals. It is based on three principles [18]:

- Provide multiple means of engagement. Learners differ in how they may feel involved and motivated to learn. Therefore, it is necessary to offer options that reflect the interests of the learners, strategies to face new tasks, choices for self-evaluation and reflection on their expectations.

- Provide multiple means of representation. Learners vary in the way they perceive and understand the educational content. Therefore, it is necessary to offer different options to approach materials through various channels of perception, be it auditory, visual or motor, so it is required to provide the information in a format that allows as much as possible to be adjusted by the learner.

- Provide multiple means for action and expression. Learners differ in how they can work in the midst of learning and express what they know. It is necessary to offer varied options for action through materials with which all learners can interact, facilitate fluent opinions, and seek the stimulation of the effort and the motivation towards a goal.

UDL presents information in ways that fit the learner, rather than requiring the learner to adapt to the information. This is good for those learners with learning and attention difficulties because it allows them to interact with the material in various ways. At the same time provides that every learner benefits from choosing the best path for their learning, which can also be useful in situations with a poor internet connection where having alternatives to access content are vital.

The development of a website that lets learners include feedback through the use of UDL will enable research on how to collect information that can barely obtain during the accessibility evaluation by experts. As well, learners can easefully fill the data from their preferred place, without the pressure of assessing with an expert in a lab.

III. YOURMOOC4ALL

This project's concept is to develop a MOOCs aggregator website, where learners can evaluate inclusive design aspects of the MOOCs they are participating in. The website will help learners to find MOOCs of their interest and that fit their requirements. The project is currently in a pilot process hosted by UNED. For the realisation of this website we have used open source technologies: Ruby as the programming language, Ruby On Rails as the development framework and the database is MySql.

YourMOOC4all is a multi-language website (Spanish and English). At this moment, it allows dynamically capturing more than 700 MOOCs in Spanish from UNED Abierta[5], MiriadaX[6] and Coursera[7] platforms and it is being

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[5] UNED Abierta, https://iedra.uned.es/
[6] MiriadaX, https://miriadax.net/cursos
[7] Coursera, https://www.coursera.org/

Fig 2. YourMOOC4ALL course information on the left, rating system following UDL principles and rating example on the right

developed so that it can also obtain them from edX[8]. In this way, the most significant spectrum of MOOC main providers in that language is expected to be covered.

In Fig. 1 we can see that the website allows the search by free text, letting to be ordered and filtered by any content of the information captured from the course. Allowing the learner to refine the search by title of the course, the theme or the information included in it; it is possible to order the results by title, institution that imparts it, platform where it is hosted, or the score obtained. Next improvements will include filtering by learners' preferences with the enhancement of the user's profile such as the availability of subtitles or transcriptions.

The dynamically captured information of the courses includes (Fig. 2):

- URL, the name of the MOOC and an illustrative image of it.
- The platform and the MOOC provider institution.
- Thematic and general information of the MOOC.
- Learning objectives, previous knowledge, recipients and required level to participate.
- Evaluation activities and estimated effort.
- Date of the last and next edition.
- Audited and credential price.
- Information about the availability of sign language, transcriptions, audio-description, and subtitles.

The evaluations are made following the framework proposed by UDL principles: with a total of 31 indicators (Fig. 2). These indicators have been developed by the authors based on the guidelines submitted by CAST[9] [16] and with the support of a UDL expert. Learners can decide to rate any of these optional indicators using a Likert scale. All the indicators offer a small tip to help the learner to understand the question with an example. Indicators fall within one of the following topics:

- Provide multiple means of engagement.
  - Evaluate the discussions and activities.
  - Formulate the learning goals.
  - Distinguish the level of difficulties of the activities.
  - The feedback provided in the tests.
  - The help from the facilitators.
- Provide multiple means of representation.
  - The adaptation of the environment.
  - The availability of subtitles, transcripts and audio descriptions.
  - The use of the language.
  - There exists a glossary.
  - Different languages are supported.
  - Different formats are available.

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8 edX, https://www.edx.org/

9 CAST, http://www.cast.org/

- o The need for prior knowledge.
- o The sequential process of the information in the MOOC.

- Provide multiple means of action and expression.
  - o Time limit to perform test and activities.
  - o External tools and social networks used.
  - o Complementary readings provided.
  - o Facilitators are helping in the discussions.
  - o Facilitate reflection.
  - o The existence of guidelines.

The learner is also allowed to include free text, which enriches the qualitative content of the data and offers information to other learners. This manner we get quantitative information through the ratings and qualitative information using the comments to validate and triangulate the data.

For research purposes, we have included two more criteria: the previous experience of the learner in the MOOC, with 5 values from "Without experience" to "I have taught it as a teacher" and the progress made in it with 3 options from "I have abandoned it" to "I have completed it". These variables will be useful to understand the motivation of the learners and their experience in MOOCs.

IV. CONCLUSIONS

At this stage, the project is a programmed prototype. Shortly, it will be launch as a real website, where learners can make online inclusive design evaluations of MOOCs as CourseTalk is already evaluating the educational content pedagogical quality.

Some of the improvements that we want to introduce in the website are:

- Include user profiling options, to be able to adapt the website and recommend the MOOCs that best suit learners' needs.

- Establish contact with platform and MOOC providers to have a fluent conversation on how to implement suggested improvements.

- Include the possibility that this project will also be developed for English-speaking MOOCs.

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