



WIDENING CREATION OF ACCESSIBLE DIGITAL EDUCATIONAL CONTENT: A COMBINED BLENDED LEARNING AND MASSIVE OPEN ONLINE APPROACH

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Introduction

Ensuring inclusive education systems at all levels and lifelong learning is a commitment shared by all the United Nations countries who in 2006 signed the Convention on the Rights of Persons with Disabilities (United Nations, 2008), by which each country should ensure that all citizens with disabilities or some special educational need have access to primary and secondary education, higher education, job training, adult education and lifelong learning, without discrimination and on an equal basis with others. This same principle should apply as well to their integration in the work environment.

To move towards an inclusive education, progressively and substantially increasing alternative education practices based on Information Technologies and Communications (ITC) are needed, through the implementation of accessible eLearning, understanding accessibility as the “extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use” (ISO 26800, 2011).

Extending this concept of accessibility to the virtual educational context (Teixeira et al., 2013), in which teachers use digital educational content, it should be ensured that the content is accessible, i.e., understandable, usable and perceivable by any student or lifelong learner who has the prior knowledge required to enrol in the training, and having any kind of disability is not a barrier to complete the training (García et al., 2012). This is even more important when we consider work based eLearning practices. In fact, in our contemporary work environments, digital skills are ever more critical for the workers to perform their tasks. In this special context accessibility cannot just be consider in relation to eLearning practices but in the framework of the work based learners relation to their work environment. Thus, when addressing e-accessibility we're not just considering how a given learner is able to access digital content, resources, support and assessment, but how he/she is able to perform as a worker in a digital environment. Widening the knowledge on how to create accessible digital content should therefore be a major goal today for training institutions.

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WCAG (Web Content Accessibility Guidelines) (W3C, 2008) is a well-known recommendation that contains accessibility guidelines to create accessible web content, but there are also other methods and/or mechanisms to make accessible all digital content. For these reasons, a course has been created, in which are taught the main techniques that a teacher has to know for creating accessible digital educational content in the most commonly used formats in online training, such as text documents, slide presentations, PDF files, videos, audio books or web pages.

The course “Creating accessible digital educational content” is aimed at teachers conducting online training, and its objective is training for teachers to create digital educational content that any student can use, whether or not they have some kind of physical or sensory disabilities. The course is organized by participants in the cooperation project ESVI-AL, which aims to move towards a virtual inclusive Higher Education in Latin America. This course has two versions. One has the format of a workshop, with a online component and a face-to-face one. The second version uses the same resources but is organized as a MOOC (Massive Open Online Course).

This paper presents how the strategy for disseminating teacher training on creating accessible educational content has been designed in such a way to include both a blended learning approach and a massive open online one. In particular we describe how a course can be designed for a closed blended learning environment and can also be used in an open massive format. In sections Goals and Competences the objectives to be attained by the completion of the training and the competences to be achieved are presented, respectively. The next section shows the contents of the workshop and then the methodology of teaching and assessment set to pass the course. A section on the MOOC methodology to be used and finally, conclusions and future work are discussed.

Goals

The objective of the training courses (workshop and MOOC) is to train teachers so they can create digital educational content in a way that is accessible to any student, whether they have or not any physical or sensory disability. Thus, a teacher will be able to create accessible educational content in different formats after finishing the workshop.

The specific objectives are:

- Contribute to specific training of teachers, teaching them to create text documents, slide presentations, PDF documents, audiovisual content and accessible web pages.
- Raise awareness among participants about the problems that trainees with disabilities have while studying subjects virtually.
- Allow the participants to acquire skills in the use of tools for creating and reviewing accessible virtual educational content.

- Empower teachers trained by these courses in order to make them multipliers, actively involved in the training of other teachers.

Competences

The main competences to be acquired in the courses (workshop and MOOC) are:

- Analyze and correct accessibility issues that a document created with a word processor such as Microsoft Word or OpenOffice Writer may have.
- Create accessible documents using word processors such as Microsoft Word or OpenOffice Writer.
- Analyze and correct accessibility issues that a slides presentation created with a presentation tool such as Microsoft Power Point or OpenOffice Impress may have.
- Analyze and correct accessibility issues that a PDF document may have.
- Create accessible PDF documents.
- Analyze and correct accessibility issues that a video may have, adding captions and audio-descriptions.
- Create audio books from accessible documents.
- Analyze accessibility issues that a web page may have, and how to solve them (W3C, 2008).

Content of the course (workshop and MOOC)

The course is composed of five mandatory teaching lessons. The main topics to be explained in each lesson are shown in Figure 1.



Figure 1. Syllabus of the workshop

Lesson 1 – How to create accessible text documents

- Guidelines for creating accessible content in Microsoft Word. Some guidelines are explained, such as “the content should be written in brief and simple language”, “indicate the language of the document”, “use a sans-serif font of at least 12 points”, etc.
- Accessibility evaluation tools. Some tools to evaluate accessibility in documents are showed, such as Microsoft Office and AccessODF.

Lesson 2 – How to create accessible presentations

- Creating accessible Microsoft PowerPoint presentations. Good practices for designing and creating accessible presentations are explained, as well as some general tips for creating effective presentations and tips for presenting in an accessible way.
- Checking the accessibility of Microsoft PowerPoint presentations. In this section, trainees learn how to execute the accessibility checker and interpret the information about the issues found.

Lesson 3 – How to create accessible PDF documents

- Accessibility in PDF documents. Basics. In this section, it is explained what an accessible PDF is and how people with disabilities access to the content of a PDF. The characteristics of an accessible PDF, some WCAG principles applicable to PDF documents and tools for analysis and correction are also explained.
- Creating accessible PDF documents. This part explains how to create accessible PDF documents from other accessible documents already created. How to evaluate the accessibility of a PDF document is also explain, as well as how to make an initial checking for detecting issues that require to modify the source document, and how to correct accessibility issues directly in a PDF file.

Lesson 4 – How to create accessible audiovisual content

- Properties of an accessible video. It explains what an accessible video should contain (transcription in text format, captions, audio description, sign language interpretation) and some tools to create accessible audiovisual content.
- Creating accessible video tutorials. Best practices to create effective video tutorials are explained, as well as some techniques for creating and editing videos, and later upload them to YouTube.
- Accessible educational content with audio. This section explains how to create accessible audio books from Word documents and with tool Balabolka. It is also explained how to insert audio in PDF documents.
- Checking the accessibility in video and audio files. One checklist for accessibility in audio documents and another one for accessibility in videos are provided.

Lesson 5 – How to create accessible websites

- Developing an accessible website. Some guidelines to develop an accessible website are explained, such as identify the language, include the title of the page, do not use colour as the only visual means of conveying information, etc.
- Accessibility of the elements of a webpage. It explains how to make accessible the elements of a webpage, such as images, multimedia (audio, video, presentations), forms, tables, etc.
- Global evaluation of the accessibility of a web page. Some techniques to evaluate the accessibility of a web page are explained.

Methodology

As stated above, the course has two versions: a workshop and a massive open course. The workshop is taught by a blended learning model, with online educational activities throughout its duration and classroom activities for a week. The workshop requires a commitment of 50 hours per trainee.

The expected duration is 6 weeks of online work for the mandatory part of the workshop, with a commitment of the learner between 5 and 6 hours weekly online, and 15 classroom hours. Another 5 hours may be considered to finish online some of the classroom tasks.

The open massive course uses the same online resources as the workshop and is organized in a fully open online format using the iMOOC methodological model (Teixeira & Mota, 2013). This model is the first institutional pedagogical model developed specifically for MOOCs and focus on four main features: learner-centeredness, flexibility, interaction and digital inclusion. It combines autonomous and self-directed learning with a strong social dimension and intends to articulate the flexibility that distance online learners need with the pacing necessary to help them get things done.

According to the iMOOC model, learning should be evidenced through the creation of artefacts freely accessible online, that demonstrate the learner's knowledge and competencies regarding the material studied. Learning support rests in the learning community, through collaboration, dialogue, peer feedback and active engagement from participants in the learning process. The course starts with a "boot camp" module, that lasts one additional, meant for participants to get acquainted with the spaces, tools and services, as well as with the processes of work and communication that will be used in the course.

According to the European Credit Transfer System (ECTS), the workshop has 2 credits in the mandatory part, since this system considers that 25 hours of student work equate to one ECTS credit.

Methodological strategies

The same methodology is applied in each lesson, which consists of performing the following teaching activities:

- Study educational content: Trainees must spend time reading and assimilating the contents of the lesson, which are presented in a sequence of interactive web pages. Trainees have the opportunity to download the contents of a lesson in one PDF or DOC file, if they want to read in this format. The educational contents of a lesson are available in the learning platform on the first day of the week assigned to that lesson in the calendar.
- Conducting self-assessments: in order that trainees check the proper assimilation of educational content, they can perform a self-assessment at any time during the study of a lesson and check their level of knowledge.

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- Participation in discussion forums: In each lesson, the tutor raises a discussion topic related to the content of the lesson, and the trainees discuss about it during the week assigned to the lesson.
- Sharing experiences with the community (MOOC version only): trainees are invited to publish comments and share resources using their own personal learning environments to manage their learning, publish their artefacts and engage in the conversation with other participants.
- Study of a case study solved: Trainees have at their disposal a practical case related to the theoretical content of the lesson, as well as the solution of that exercise, which allows learning how to solve similar cases.
- Viewing videos: In each lesson trainees are offered at least three short videos with captions, which can be played and viewed at any time. They are:
 - A presentation video of the lesson.
 - An explanation video of a topic of discussion in the forum.
 - An explanation video of a practical exercise solved.
- In the workshop version there's also the conducting of practical classroom activities: one additional week is dedicated to perform practical classroom activities, in 5 sessions of 3 hours each. In these sessions, the tutors-trainees interaction is powered, performing practical cases and discussing the results in common.

As a proof of completion of classroom activities, trainees must send to the tutors the work performed during the classroom sessions. They can do this at the end of the week or later, to have the opportunity to review it and, if necessary, improve it before sending it to the tutor.

Educational contents and resources

The main materials used in the course (workshop and MOOC) are:

- Online content: The online training content is designed as open educational resources (OER) and is offered in various formats: web, PDF, Word, PowerPoint and video.
- Resources for practical work: Trainees are offered the statements of the practical work to be performed in each lesson, and the software needed to solve it is indicated. The software is generally free to use, except in the case of the Microsoft Office 2007 or 2010 suite for lessons 1 and 2. If trainees do not have those programs, the corresponding exercise can be performed with a free editor similar, such as Libre Office, although the content is designed to Microsoft Office because it offers tools to evaluate automatically the accessibility of documents and presentations.
- Resources for classroom practices (workshop version only): In general, in classroom practices the same programs are used than in online practices. The classroom practices are conducted in a classroom equipped with a computer per student, with the necessary software already installed.

Assessment

Different activities of trainees' assessment are carried out in order to check the acquisition of the competences provided in each lesson of the course, depending of the version (workshop or MOOC).

In what concerns the workshop, assessment activities have been planned for the online part and the classroom part. The total maximum grade that can be obtained in the workshop is 100%, considering the workshop passed with a grade of at least 60%.

The online part represents 60% and the classroom part represents 40% of total, according to the following distribution:

1. Online phase (60%): The study of the 5 lessons online represents 60% of the grade, according to the following breakdown:
 - Assessment test of theoretical knowledge of the lessons (20%): This is a questionnaire with a maximum score of 4% per lesson.
 - Participation in the discussion forum of the lessons (10%): The level of trainees' participation and discussion in the forum of each lesson is assessed, with a maximum score of 2% per lesson.
 - Online practical work of the lesson (30%): Students must send the resolution of a practical case raised in the lesson to the tutor. The maximum score of the practical work is 6% per lesson.
2. Classroom phase (40%): The work done by the student in classroom activities and the quality of the work that will be sent after the week are valued.
 - Assistance to classroom activities (10%).
 - Level of participation in classroom activities (10%).
 - Personal work sent to the tutor as evidence of the classroom activities performed (20%).

As for the MOOC version, graded assessments are included for participants who want to receive a certificate of completion of the course. At least two of the artefacts produced as evidence of learning by participants will be assessed and graded through a peer-review system – those who wish to participate in the peer-review assessment will grade the artefacts produced by 3 other participants and have their artefact graded by three other participants. The final grade will be the average obtained in the 3 grades given. Every assessment will be based on a detailed rubric provided by the professor or professors leading the course.

Conclusions and future work

The two-versions course created allows trainees who perform it to create accessible educational digital content. So far the workshop has been launched in different test groups in Latin America and the results have been positive. The results obtained in these pilot groups

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will be analyzed and studied shortly, and the results and the learned experience in these first workshops will be published.

We are currently developing the MOOC version so that it can reach a wider audience and the training can be completed entirely online. By that the classroom part of the workshop is not an obstacle for widening the impact of this specific training. We think in this way awareness about the importance of creating accessible educational digital content may be broader and may be widespread throughout the world.

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