Challenges for International und Multilingual MOOCs:
A case study for the ILO Information Literacy online learning service

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Abstract
The development of Open Educational Resources and especially of Massive Open Online Courses (MOOCs) is a huge trend. Open Educational Resources lower barriers to education and have the potential to improve access to knowledge for many people. However, MOOCs are often not available in many languages and English dominates the online offers. In this paper, we report the development of a MOOC for Information Literacy, which will be available in several languages in parallel. First, we report on the development of the content for the MOOC. The creation of a learning resource in several languages poses several practical, technological and cultural challenges. The awareness about the issues facilitates the design of such offers.

Keywords: MOOC, Information Literacy, Multicultural, Multilingual.

Introduction
The participation of citizens in our modern society is to a large extent based on information tools and information resources. The trend of digitalization is adopted by more and more enterprises and other organisations. Digitalization is the use of digital technologies to change and optimize social processes. It can lead to innovation and value-producing opportunities. More and more aspects of our lives become strongly affected by digitalization. For entertainment, finding products, identifying relevant information and even for e.g. finding jobs, citizens need to access knowledge bases by information tools.

For being successful in society, citizens need to find appropriate information and interact with it adequately. Citizens need a complex set of competences for dealing successfully with the social environment created through digitalization. This set of competencies is most often referred to as Information Literacy.

Information Literacy (IL) is 'the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning' (American Library Association, 2016). IL as a key competence is particularly essential in post-

secondary education and research. An extended version of IL is known under the term 'metaliteracy' (Jacobson and Mackey, 2016) which goes beyond the competence to search successfully by including collaborative production and sharing of information in digital environments. The concept of metaliteracy is integrated into the new Framework for Information Literacy for Higher Education (American Library Association, 2016). Metaliteracy is intended to serve as a comprehensive framework unifying IL with related literacies, in particular with media literacy and with computer literacy. Metaliteracy stresses the importance of collaboration and reflection as well as the crucial ability to critically self-assess different competences. Metaliteracy considers more recent developments as participation and collaboration within online learning and social media.

According to many studies the level of Information Literacy of university students is low (e.g. Rubinić et al., 2013, Maurer et al. 2016). Often, college education does not develop Information Literacy skills. There is a great demand for content and services to educate students regarding Information Literacy.

The project Information Literacy Online - Developing Multilingual Open Educational Resources Reflecting Multicultural Aspects (ILO) intends to create a MOOC which can be used to study and enhance the IL skills. Although there are already many online courses for IL, they are most often offered in English or do not encompass a modern approach to IL. The ILO project intends to provide a MOOC in several localized versions in order to serve students in their native language and culture. The partners in ILO will provide the online course in English, German, Spanish but also in Catalan, Slovenian and Croatian. For the latter, there are only very few MOOCs available at all. The multilingual approach will not only consider formal translation but also cultural-specific differences.

State of the Art

Many online learning resources for Information Literacy can be found (e.g. http://primodb.org). They implement several different pedagogical approaches (Courtney & Wilhoite-Mathews 2015). However, many of them lack a holistic approach and often focus on skills like locating and accessing. They often do not include components regarding higher level skills like synthesis and creation.

Another major shortcoming of current IL courses is the lack of self-assessment components although efficacy has been discussed for a long time (e.g. Kurbanoglu 2003). Therefore, a central innovative approach of the ILO MOOC will be the implementation of technology based assessment components (among others extending that of (Hahnel et al. 2018) which allow students to get feedback on their learning success.

The design of multilingual systems is a challenge for the creators of online learning material. Very little online learning content is available in several languages.

Moreover, only few systems are available for implementing online courses in many languages. We expect that the interface for a course should be localized in order to lower the access barrier for learners independently of their language abilities. Only a few popular systems have multiple localized translations available. The eLearning system Moodle is the most popular of these platforms. However, Moodle is not specifically designed for MOOCs. Modern MOOC software such as Instructure Canvas[1] or Open edX[2] are not available for all languages. For Open EdX, the open platform for localisation, transifex.com is used to create localized versions as a community effort; any translator may be contributing. Our experience thus far is that very little of the Open edX software has been localized for several European languages. As an example, regarding to ILO project, there are only few translations in Catalan, Slovenian and there is no translation into Croatian yet.

The translation of learning material is a tedious task. Translation theory has long given up the idea of full equivalence and has moved toward functional theories for translation: „Dynamic equivalence is [. . .] to be defined in terms of the degree to which the receptors of the message in the receptor language

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[1] https://canvas.instructure.com/

[2] https://open.edx.org/

respond to it in substantially the same manner as the receptors in the source language. This response can never be identical, for the cultural and historical settings are too different, but there should be a high degree of equivalence of response, or the translation will have failed to accomplish its purpose" (Nida & Taber 1969: 24). As the quote shows, the translation needs to constantly consider the context regarding e.g. the previous knowledge, the teaching traditions and the learning outcomes in order to achieve a high quality OER in each language. This also shows that considering language is not sufficient. For each translation and especially for creating an interactive resource, culture should be considered.

Culture is a complex phenomenon which is hard to grasp and define. It is mostly agreed upon that despite many obvious signals of culture, the major differences are invisible. In general, cultural theory for understanding and improving eLearning should focus on the different patterns of behaviour as observed in groups. These invisible ways of thinking and dealing with the world are difficult to access. This leads to many misunderstandings in intercultural encounters. For example, while the greeting behaviour can be easily observed in a different culture, it is much more difficult to find out how a culture deals with unavoidable uncertainties of our existence or encourage a learner to keep on researching for an exercise.

Cultures are often classified in accordance to their relative positions on a number of polar scales which cultural anthropology commonly calls cultural dimensions. The position of a culture on those scales is determined by the dominant value orientations. Such quantified models of culture are difficult to find. Hofstede originally defined four dimensions of culture (Hofstede & Hofstede 2004):

- *Power distance* measures the extent to which subordinates (employees, students) respond to power and authority (managers, teachers) and how they expect and accept unequal power distribution. In high power distance cultures, individuals pay more respect to superiors and value authorities. In low power distance cultures, the equality of people is emphasized.
- *Individualism vs. Collectivism*: these value orientations refer to the ties among individuals in a society. In collectivist cultures, individuals define themselves more as members of a social group. They are expected to share their belongings with the group and can rely on the backup within the group. Harmony is a highly desirable value. Individualistic cultures have loose personal connections and expect rewards for hard work.
- *Uncertainty avoidance* describes the extent to which individuals feel threatened by uncertain or unknown situations. High uncertainty avoidance cultures try to avoid and prepare for risks and install control mechanisms. They seek a collective truth whereas cultures with a low score welcome new initiatives and accept change.
- *Masculinity vs. Femininity*: these two extreme values of this dimension focus on the differences between the social roles attributed to men and women and the expected behaviour of the two sexes. Masculine values are related to competitiveness and feminine values are related to quality of life. In countries with low masculinity scores, the distinction between the roles is not transparent. Women also work in male-dominated professions, there is much cooperation and men are allowed to be sensitive and kind.

Later, Hofstede added a fifth dimension which is related to time: *Long-term vs. short term orientation*. Long-term oriented societies are willing to invest and wait longer for the return. In short-term oriented cultures, individuals want to get the return for their investment very soon (Hofstede & Hofstede 2004).

The theories of Hofstede have been used in optimizing online material and human-computer interaction for heterogeneous user groups (e.g. Heimgärtner 2012). Others have applied Activity theory as a basis for considering intercultural differences in the design of online learning materials (Denman-Maier 2004).

There has also been research on the design of learning systems. The adequacy of different learning theories for cultures has been assessed to design learning material for heterogeneous audiences (Kamentz 2011).

We conclude from the review of earlier work that hints toward a multilingual MOOC are available from cultural studies and several resources are available toward the teaching of information literacy but we have found none that combine both approaches. The ILO project thus attempts, at the small multicultural European scale, to tackle the multilingual development of an online self-paced learning content that is compatible with each of the intended six cultures.

Methodology within the ILO Project
The content of the ILO MOOC based on the SCONUL Seven Pillars of Information Literacy (2011), on the ACRL Framework for Information Literacy for Higher Education (2016) and on the Metaliteracy model (Mackey and Jacobson, 2016). Since it is expected that the MOOC should include students with different levels of previous knowledge, the SCONUL approach is adequate as it has the same prerequisite. The Metaliteracy model expands the scope of traditional IL skills (determine, access, locate, understand, produce and use) to include the collaborative production of information in digital environments (collaborate, participate, produce and share), especially in MOOCs. The new ACRL Framework (2016) draws significantly upon the concept of metaliteracy. In creating the content for the MOOC, the project is going to address and integrate the mentioned concepts of IL into the course objectives, learning outcomes and specific course units.
The focus of the content is not only on lower level IL skills (access to sources and finding information), but also IL skills on the higher level (evaluation, interpretation and use), which include critical thinking, knowledge construction and collaborative learning. MOOCs are suitable for facilitating those skills because the main characteristics of MOOCs are the orientation on the learner and collaborative learning. The content is going to be constructed after the best practice analysis of other IL course content (Dreisiebner & Mandl 2017).

The modules in the ILO MOOC are the following:
- Module 1: Orienting in an information landscape
- Module 2: Research is a journey of inquiries
- Module 3: The power of search
- Module 4: Critical information appraisal
- Module 5: Information use: the right and fair way
- Module 6: Let's create something new based on information and share it!

From the perspective of the content the multilingual approach is taken. The content of the modules is first collaboratively developed by the partners in English: a sketch is shared as a document to depict all concepts that will be studied, all examples, all questions, and all quizzes; then, the online learning content is realized, made of videos, interactive quizzes, question texts, and reading materials. Each of these realizations is consolidated by partners who comment on feasibility, correct and enrich. Only then is the content translated to each local language. This work is conducted at the partner institutions for their local languages, namely the University of Graz (Austria), University of Hildesheim (Germany), University of Ljubljana (Slovenia), University of Zadar (Croatia), University of Barcelona (Spain), The City University (Great Britain) and German Institute for International Educational Research (Germany).
In this each interaction, the issues met to apply the MOOC in different cultures areaddressed and collected.
In order to facilitate translation and commenting, common editing practices are being established mediated by a common content storage in the form of the versioning system GitLab. This allows simple text translations to follow the successive enhancements of content, if need be, or to share Screencast-O-Matic sources so that translators can adapt only the necessary parts.
An evaluation scheme will follow in the later phase of the ILO project. It will consider the content, the learning success and the interaction with as well as the satisfaction of the students with the learning resource. Several tools will be applied to this end, from learning analytics of learning traces in the usage of the MOOC to interviews, from quiz results to standardised assessments.

Challenges due to Multilinguality

The design of the parallel multilingual MOOCs has led to many challenges already in the first project phase. First, we will discuss the technical issues and the video production. After that, content related aspects will be discussed. These linguistic and cultural issues will be explored based on examples.

To foster the user experience and learning success of the participants, ILO shall provide separate MOOCs for each involved language. A thorough analysis of several available software solutions for providing a MOOC platform lead to the conclusion to use Open edX for implementing ILO. The analysis revealed that there are already advanced solutions available in terms of functionality, but that multilingualism is still a major issue. None of the analysed software solutions offered full translations for all involved languages. Existing translations are usually provided through the web community, in case of Open edX through the localization platform transifex.com. Working with these translations has shown that some of them are even wrong and that the translation validation process is rather unequal. This leads to the need to not only conduct additional translations, but also to proof-check existing translations.

As a standard content of a MOOC, videos play an important role. Video production has proven within ILO to be a challenging task in terms of multilinguality. If videos should be completely translated, especially if they consist out of screencasts, they need to be independently produced for each language. Screencasts can be a complementary tool for online learners (Peterson, 2007). However, into ILO project screencast is a relevant aspect since information science is commonly shown in the actual manipulation of digital information. A possible approach to reduce the effort of translating videos is to stick to a common English user interface when producing the screencast. Later on, just the voice track needs to be changed. A more basic approach would be to add subtitles, which are the only element that is translated. However, all of these approaches require at least basic technical skills in video editing and video production. Therefore, special attention needs also the sound where tracks must be clearly understood. Moreover, a common software needs to be used, to allow editing for all of the involved partners. For this reason, within ILO project the software Screencast-O-Matic is used, that provides a simple but powerful functionality too.

The translation of the content provided in text format is a straight forward process. However, even there, many terms need to be carefully dealt with. For example, there are two synonyms for *recall* in Slovenian. In Germany, the term has been used with a different meaning in popular TV shows. In a dance and fashion show for candidates, it means that successful candidates in the competition can come back and continue to participate. These are classical translation issues and require attention and domain knowledge in the translation process.

A key competence for Information Literacy is searching. The skills for search need to be strengthened by providing realistic search examples. The search terms for examples need to be translated, but often that is not sufficient. The terms may have other synonyms or homonyms in another language and have to be well suited as example.
A MOOC on Information literacy requires many concrete examples and recommendations for preferred tools. The Information literacy content has to be connected to knowledge about tools which are suitable for searching in the specific culture. In some cultures, there may be e.g. no domain specific search portals for certain disciplines. For these cultures, the examples need to be adopted and if there is no publication culture in a language (e.g. computer science for Dutch) the setup of the learning goals needs to be reconsidered.

Beyond that, the cultural issues remain. These are less obviously visible and will require careful attention during the evaluation. There may be different learning cultures and a different level of

acceptance of certain methods. E.g. memorizing facts can be considered a valid method in some cultures but not in others.

One important dimension regarding learning within the cultural framework of Hofstede (Hofstede & Hofstede 2012) is the dimension power distance. How much is the teacher considered as an authority that cannot be challenged? The ARCL (2000) IL definition emphasises the 'instructor as facilitator', which may not be equally well suited for all cultures. This additional complexity leads to the acknowledged 'messiness' compared to skills-based frameworks (McGarrity 2016) which may be an issue also regarding the cultural dimension of uncertainty avoidance.

The largest differences in the cultural dimensions between the partners have been identified and the values of the cultural dimensions can be seen in Table 1.

Table 1. Cultural dimensions for ILO countries (extracted from www.hofstede-insights.com)

Cultural Dimension	Germany	Austria	Spain	UK	Slovenia	Croatia
Power Distance	35	11	57	35	71	73
Individualism	67	55	51	89	27	33
Masculinity	66	79	42	66	19	40
Uncertainty Avoidance	65	70	86	35	88	80
Long Term Orientation	83	60	48	51	49	58

The largest differences can be seen between the neighbouring countries Slovenia and Austria regarding Individualism and Power Distance. For Uncertainty Avoidance, the UK has a very low value compared especially to Slovenia.

In ILO, particularly the formulation of instructions to students has been identified as an issue. Whereas it is normal in Germany or the UK to explain a task and demand students to work as fast as possible when solving it, this seems inadequate for Slovenia and Croatia. This issue came apparent in a first preliminary translation of the MOOC.

The design of the instructions seems to be related to cultural dimensions and needs to be considered with specific care in order to create a learning experience which is culturally adequate and which therefore, allows a natural environment and good learning progress for local students.

Conclusion and Recommendation

The development of the ILO MOOC can serve as a model to create MOOCs in parallel version in order to generate more online learning materials and OER in languages which have very little content so far. This is a crucial issue in maintaining the linguistic and cultural diversity and it is necessary to facilitate access to information and learning opportunities online for all citizens.

The selection of a system should be made early within the development. The candidates are modern online learning platforms. However, the availability of translations of the interfaces for the languages in question needs to be checked early on.

The localization process adopted within ILO has proven to be adequate so far. The model to develop the MOOC and its content first in English seems adequate and practicable. It can be recommended to pursue as suggested.

As far as cultural issues are concerned, the instructions for students are a good starting point to discuss the differences. Also, the content of any MOOC might need to be adopted.

The ILO MOOC will be offered in the English version at the end of 2018 and in its localized versions in 2019 through the project website https://informationliteracy.eu.

Acknowledgments

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