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Open educational resources repositories literature review – Towards a comprehensive quality approaches framework

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ABSTRACT

Today, Open Educational Resources (OER) are commonly stored, used, adapted, remixed and shared within Learning object repositories (LORs) which have recently started expanding their design to support collaborative teaching and learning. As numbers of OER available freely keep on growing, many LORs struggle to find sustainable business models and get the users' attention. Previous studies have shown that Quality assurance of the LORs is a significant factor when predicting the success of the repository. Within the study, we analysed technology enhanced learning literature systematically regarding LORs' quality approaches and specific collaborative instruments. This paper's theoretical contribution is a comprehensive framework of LOR quality approaches (LORQAF) that demonstrates the wide spectrum of possible approaches taken and classifies them. The purpose of this study is to assist LOR developers in designing sustainable quality assurance approaches utilizing full the potential of collaborative quality assurance tools.

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1. Introduction

For the last two decades, a rapidly growing amount of Open Educational Resources (OER) has become available in Learning objects repositories (LORs) for educators to re-use, re-publish and share within their communities, supporting collaborative learning (Dimitriadis, McAndrew, Conole, & Makriyannis, 2009). Smaller OER repositories are built into federated repositories by being harvested for their metadata to improve access to higher numbers of learning objects (Tzikopoulos, Manouselis, & Vuorikari, 2007). Unfortunately, these repositories are not used up to their full potential (Dichev & Dicheva, 2012; Mitchell & Lutters, 2006; Ochoa & Duval, 2009). Thousands of digital resources are created collaboratively and published online every day, and their quality control, assurance and evaluation are of paramount importance for potential users (Downes, 2007; Palavitsinis, Manouselis, & Sánchez-Alonso, 2013). OER enable forms of collaborative learning (Dillenbourg, 1999) and LORs of today can be considered as computer supported collaborative learning (CSCL) environments as they provide users tools for posting knowledge productions into a shared working space and providing tools for progressive

discourse interaction between the users (Scardamalia & Bereiter, 1994). Adding social and collaborative features has been a recent trend of LORs to facilitate wider user engagement (Monge, Ovelar, & Azpeitia, 2008; Sánchez-Alonso, Sicilia, García-Barriocanal, Pagés-Arévalo, & Lezcano, 2011).

According to previous studies (Attwell, 2005; Barton, Currier, & Hey, 2003; Clements & Pawlowski, 2012) quality of OER plays a significant role in the success of the open content repositories (LOR) (Cechinel, Sánchez-Alonso, & García-Barriocanal, 2011; Tate & Hoshek, 2009). Therefore, it is vital to study LORs quality approaches (Clements, Pawlowski, & Manouselis, 2014) in a systematic way. Previous literature reviews on LOR quality approaches have focused on metadata quality only (Palavitsinis et al., 2013) and in the case of Atenas and Havemann (2014) have defined quality approaches quite simply as any approach which might attract users' to re-use content. However, this is the first systematic LOR quality approaches literature review which looks at quality management as a holistic approach around the repository, not only focusing on the quality instruments but also policies, standardization and pre-publication related quality approaches. This literature review puts emphasis towards collaborative tools such as peer review (Neven & Duval, 2002), which contribute towards the quality assurance of the repository. CSCL is an emerging research field that focuses on how collaborative learning, supported by technology, can enhance peer interaction and work in

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groups, and how collaboration and technology facilitate sharing and distributing knowledge and expertise among community members (Lipponen, Hakkarainen, & Paavola, 2004).

Learning object repositories quality approaches have previously been classified as (Pawlowski & Clements, 2010):

1. The Generic Approach of Quality standards (e.g. ISO 9000 standards (Stracke, 2009), European Foundation for Quality Management Excellence (European Foundation for Quality Management, 2014).
2. Specific Quality Approaches (e.g. Content development criteria or competency requirements) (Leacock & Nesbit, 2007).
3. Specific Quality Instruments (e.g. user generated collaborative quality approaches such as rating (Nesbit, Belfer, & Vargo, 2002), peer review (Neven & Duval, 2002) or recommender systems (Manouselis, Kyrgiazos, & Stoitsis, 2014).

In this study, we investigated quality approaches for LORs with a systematic literature review (Kitchenham (2004)) in order to understand the holistic phenomenon of quality assurance comprehensively and to form a quality approaches framework which LOR developers can take into account when designing new repositories as well as improving the quality of the existing ones. The classification above was used to guide our review process as the starting theoretical framework.

This paper is organized as following: In the second section, we describe the main concepts of educational resources and learning object repositories. In the third chapter we define quality approaches around repositories. Chapter four describes the literature review methodology and systematic mapping of quality approaches. Chapter five presents the analysis of the results and the learning object repositories quality assurance framework (LORQAF). The paper concluded with a summary of results clarifying the contributions of this study for theory and practice.

2. Theoretical background

2.1. Open educational resources

Downes (2007) describes Open Educational Resources (OER) as: "In the system implemented by Creative Commons (widely thought to be representative of an "open" license) authors may stipulate that use requires attribution, that it be non-commercial, or that the product be shared under the same license. According to Wiley and Edwards (2002) a learning object is "any digital resource that can be reused to mediate learning." OECD's (2007) definition was: "Open educational resources are digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". Very popular definition of OER is by UNESCO (2002) defining OER as "technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes". Davis et al. (2010) described educational resources as sets of resources, which have been assembled and described with the intention that they could be picked up and re-used by others. Harmonizing the previous definitions, this study defines OER as "All resources for the purpose of learning, education and training which are freely accessible for the user". In the context of this paper, we recognize that educational resources' synonyms from the technology enhanced learning literature include: 'learning objects, digital resources, digital content, digital resources, reusable learning objects, educational objects, educational resources and educational content'. Digital resources can be shared, re-used and collaboratively created across different countries and cultures (Laurillard, 2008). Open

educational resources can support collaborative learning particularly well because they have been designed to be enhanced and repurposed and therefore can support cognitive processes behind collaborative learning (Dimitriadis et al., 2009). OER also provide opportunities for long term collaboration and partnerships beyond people's daily context (Pirkkalainen & Pawlowski, 2014).

OER's significant milestone in its history was MIT's OpenCourse Ware Initiative (Abelson, 2008) where large amount of courses were made freely available. After MIT's example, many institutions have followed the policy of giving out course materials for free – selling the diplomas or graduation certificates. This way OER can work as a marketing tool for the institute's recruitment. OER certainly have been accepted in the community, but face the common problems of the 21st century: Information is in such large quantities – how to get the teachers' attention towards these materials? In order for OER to be re-used, they have been most commonly gathered into databases that are linked to a user interface portal. This is called a Learning object repository.

2.2. Learning object repositories

LOR are multi-functional platforms which are designed to facilitate access to reusable learning objects in a variety of formats, so users can search for, find and make use of this content (Downes, 2001). Learning object repositories can also be defined as digital databases that house learning content, applications and tools such as texts, papers, videos, audio recordings, multimedia applications and social networking tools (McGreal, 2011). The purpose of a repository is not simply safe storage and deliver resources, but allow their administration in terms of updating, identifying, utilizing, sharing and re-using them (Retalis, 2005). OER creation also provides potential for teachers and educators for co-creation and collaboration, which are processes that state-of-the-art LORs try to support through social networking features (Okada, Mikroyannidis, Meister, & Little, 2012). Although such LORs using social software for collaborative learning and teaching raise barriers for users in areas like cultural distance and lack of quality (Pirkkalainen, Jokinen, Pawlowski, & Richter, 2014). Some popular examples of LORs include: Le Mill,¹ OER Commons² and KlasCement.³

McGreal (2008) classifies learning object repositories into three basic types:

1. Centralized model with content stored on the site.
2. Portals that mainly store links and metadata to materials provided by others.
3. Repositories with equal role as a content provider and portal.

McGreal's (2008) study has been widely used as it identified the principal functionalities of LORs as: search/browse OER, view OER, download OER, store OER and download OERs metadata.

Another type of classification is based on the nature of the content and content providers: Learning object repositories might contain resources from a certain topic (thematic repository). Many ministries of education have their own nation-wide portals for all topics (National repository). LORs which harvest metadata from other repositories are called 'Federated repositories' (Clements et al., 2014).

General characteristics of well known LORs were studied by Tzikopoulos, Manouselis, and Vuorikari (2009). Their investigation covered features such as educational subject areas covered, metadata, standard used, LOs availability in different languages, quality

¹ <http://lemill.net/>.

² <https://www.oercommons.org/>.

³ <http://www.klascement.be/>.

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