Chapter 5

Requirements Capture Analysis for MOOCS in Higher Education

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ABSTRACT

One of the attention grabbing headlines in the last two years has been of hundreds of thousands of students enrolling on MOOCs (Massive Open Online Courses) that are being offered by some of the world’s top Universities. Large numbers of students are starting these courses, and significant numbers – though only a small proportion of the cohorts – are apparently able to pass these courses. There is considerable momentum behind this movement and it is clearly here to stay in some form. This chapter includes a reflection on how MOOCS can become main stream and considers the requirements that such systems should meet, for students as well as for Higher Education (tertiary) institutions. The chapter considers requirements for students of Open and Free Access and the need for high quality materials. Furthermore, it considers how Computer science approaches for requirements capture can be used to identify features for MOOC and shows how these platforms can fit into blended learning.

INTRODUCTION

A typical Virtual Learning Environment supports a wide range of teaching activities and concepts.

One of the attention grabbing headlines in the last two years has been of 100 000s of students who are enrolling on MOOCs (Massive Open Online Courses) that are being offered by some of the world’s top Universities (A complete list of Massive Open Online Courses, 2014). Large numbers of students are starting these courses, and significant numbers – though only a small proportion of the cohorts – are apparently able to pass these courses. There is considerable momentum behind this movement and it is clearly here to stay in some form. Whilst some commentators consider MOOCS a disruptive technology, with the potential to fundamentally alter existing traditional Higher Educational provision, this chapter will reflect on how MOOCS will become main stream and talk about the requirements for individual

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students as well as for Higher Education (tertiary) institutions such as Universities. The chapter will include the identification of requirements for students of Open and Free Access and the need for high quality materials. What both students and institutions also require is good completion rates and recognized and certified qualifications. For Institutions, whilst they may like the volume of students, they also actually require good completion and pass rates. Linked to this they also need quality delivery material and software, and platforms (internet vehicles) on which to trade.

Some of the concerns about MOOCS have focused on the lack of match to their actual use. This is where requirements capture (Konsynski, 1984) has a role. Requirements capture is a formal approach within the discipline of Computer Science, which enables a systems’ needs to be clearly identified and turned into specifications of a system. Successful requirements capture should lead to a system that meets all of the different user needs functionally, and reflects the processes that the system is intended to support. There are numerous approaches for requirements capture, with techniques such as Use CASE and systems modelling approaches can be used to analyze the requirements for future MOOC like platform. Furthermore, beyond the pure MOOC approach such platforms can fit into blended learning (essentially a clicks and mortar) approach to learning, as opposed to the pure eLearning offered by the ideal MOOC.

Intelligent education systems that cater to the needs of the learner, and that offer appropriate learning materials in a form that is structured is one area where MOOCS may be able to add to and extend the benefits of a traditional university education. Approaches that are considered that are particularly relevant to MOOCS include the following items.

- **Inquiry based learning** – an approach to teaching that aims to strengthen the links between the research context of Higher Education, and the leaning process that the students are following (Brayshaw & Gordon, 2008). This can be shown to be effective in terms of encouraging and supporting team work, and has the potential to be a key element in more novel uses of MOOCS and on campus learning.

- **Gamification** offers a number of techniques and opportunities to motivate students (Gordon, Brayshaw, & Grey, 2013), and can potentially deal with many of the difficulties of encouraging student engagement. This has a clear relevance to MOOCs, where the retention rate is typically very low – and traditional models of teaching and assessment are clearly not fit for purpose.

- **Assessment** is one of the key areas where formal learning differs from informal learning. When it comes to demonstrating the achievement of learning outcomes, and to recognition of completing and understanding material, assessment is required. However, assessment comes in a variety of forms, from diagnostic, through formative to summative – and all can be used to encourage and monitor engagement (Gordon N., 2009). Supporting these and allowing them to link together is one area where it becomes important to be able to link different assessment activities, in particular in terms of the outcomes from one informing the next.

- **Intelligent, adaptive and personalized** approaches to learning (Wen, Brayshaw, & Gordon, 2012) can enable the content to be customized to reflect the current skills and knowledge of a student, based around a structured network of content, with access to some material controlled by assessments (gates). One aspect is the assessment itself, which can be designed to adapt to the student’s answers. This flexi-level approach is well established (Lord F. M., 1970) and can be applied in a variety of domains, especially those with a strong mathematical or logical structure (see for