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# SELF-REGULATED LEARNING BEHAVIOUR AND MOOC PARTICIPATION

Colin Milligan & Allison Littlejohn

## ABSTRACT

Massive Open Online Courses (MOOCs) are typically designed around a self-guided format that assumes learners can regulate their own learning, rather than relying on teacher guidance. However, MOOCs attract diverse groups of learners, many of whom have difficulty with self-regulation. This study examined how health professionals regulated their learning in a MOOC: Fundamentals of Clinical Trials offered by Harvard and edX. The study addresses the research question: *What self-regulated learning (SRL) strategies do professional learners apply in a MOOC?* A self-report instrument was used to measure SRL factors, which are an indicator of good self-regulation. The instrument produced an SRL profile for each learner, surfacing individual assessments of how professionals self-regulate their learning. Profiles were supplemented by qualitative data from 35 interviews, which exposed how each learner enacted each SRL sub-factor. Learners with high and low SRL scores described qualitatively different levels of self-regulation. When mapped against qualitative data about each learner's SRL strategies, the profiles appear to provide a fair representation of the learning process. These profiles could be provided to learners to help them reflect on their learning. Improved understanding of their own capacity to self-regulate their learning may guide learners to improve their learning and development.

## EXTENDED ABSTRACT

Massive Open Online Courses (MOOCs) signal a form of online learning which is 'open access' and at scale. Many MOOCs are designed around a self-guided format that assumes learners can self-regulate their own learning, rather than relying on teacher guidance. However, MOOCs attract diverse groups of learners, many of whom have difficulty with self-regulation (Milligan, Littlejohn, & Margaryan, 2013). The ability to self-regulate learning is influenced by personal psychological (cognitive and affective) and environmental factors (Zimmerman, 2000). Factors affecting self-regulated learning in formal, online courses are well documented and include self-efficacy, interaction with other people, and task strategies (see Bernacki, Aguilar, & Byrnes, 2011 for a comprehensive review). MOOCs, however, are qualitatively different in scale and openness. The strategies needed for effective self-regulated learning in MOOCs are not well understood. This gap in knowledge is of concern, given the recent rapid growth of MOOC courses: the leading provider, Coursera, recently surpassed ten million course enrolments (source: coursera.org).

This work identified factors that affect professionals' self-regulated learning (SRL) in a MOOC. The study examined how health professionals regulated their learning in the Fundamentals of Clinical Trials MOOC offered by Harvard and edX (<https://www.edX.org/course/harvard-university/hsph-hms214x/fundamentals-clinical-trials/941> - see Milligan, Littlejohn & Ukadike, 2014). This report examines the research question: *What self-regulated learning strategies do professional learners apply in a MOOC?*

The MOOC provided 34,000 healthcare professionals and students from 168 countries with an introduction to clinical trials research. A message posted to the course website in week 4 (of 12) in November 2013 invited learners to participate in the study by completing an online survey instrument (<http://tinyurl.com/srlmq>). The survey instrument was used to create an SRL profile for each study participant (n=350, self-report). Participants answered questions related to eight sub-factors of SRL which are significant for professional learning: *self-efficacy, goal setting, task interest value, task strategies (including elaboration, critical thinking), help-seeking, interest enhancement, self-evaluation and self-satisfaction*. A visual representation of how each learner self-regulated their learning was derived by normalising and plotting the scores for each factor as deviations from a mean score. Participants who completed the survey instrument, who identified as healthcare professionals and who scored a High or a Low SRL overall score were invited to participate in a semi-structured interview to probe in more detail

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their learning within the MOOC. The interview questions (<http://tinyurl.com/plmooc-script>) were designed around three phases of SRL (planning, performance, self-reflection) and associated sub-factors identified by Zimmerman (2000). Thirty-five Skype interviews (16 male and 19 female, from 23 countries) were conducted and recorded. Transcripts were analysed and narrative descriptions of SRL behaviour in the MOOC were coded. Ethical standards for the study were adopted in accordance with local regulations.

The method provided a learner profile for each individual. Each profile represents the learner's view of how they self-regulated their learning, illustrating the relative strength in how the learner applied each of the sub-factors. These visualisations were supplemented by coded data from the interviews, allowing identification of how each sub-factor was enacted by each learner. Learners with a HighSRL score demonstrated good self-regulation in a number of sub-factors. The SRL strategies of learner 152 is typical of a HighSRL. The learner demonstrated good self-efficacy, reporting: '*I'm sure after this course I'll be much better in dealing with my daily job tasks*'. She signified persistence in learning, describing '*hurdles*' as a routine aspect of learning that could be overcome. Her learning performance included help-seeking, which is significant in SRL. However, her learning task strategies tended to be limited to watching 'video content and the homework content and the assignment'. This rather limited set of learning approaches is typical of HighSRL in the MOOC. Learners with a LowSRL score applied qualitatively different self-regulation patterns. Learner 213 typifies the low self-efficacy of LowSRL: '*I hoped I can get the certificate, but I found it quite difficult for me*'. Also persistence in learning was not evident '*I tried to get through the course... I may not achieve my original goal*'. This learner did not attempt to change learning strategies, increase effort, or seek help from others. However, the learner did report a similar, limited range of learning approaches, evidenced by both LowSRL and HighSRL.

This study identified significant factors of SRL in MOOCs that can be used to produce a learner profile. Each profile represents the learner's view of how they self-regulate their learning. When mapped against qualitative data about each learner's SRL strategies, the profiles appear to provide a fair representation of the learning process. Small qualitative differences in the learning strategies of LowSRL and HighSRL were identified. However, these differences were not sufficiently pronounced to be considered significant. Learner profiles generated by the quantitative instrument could be reflected back to learners as a prompt to trigger reflection on their learning. Increased understanding of their own capacity to self-regulate their learning may help learners improve their learning and development. The complex relationship between SRL ability and context limits the extent to which findings from one MOOC can be generalised beyond the original context. Analysing SRL profiles of learners participating in different types of MOOCs would help ascertain the potency of the instruments and method used in this study.

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