Computers & Education 91 (2015) 83–91

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Context counts: How learners' contexts influence learning in a MOOC

Nina Hood [c, *], Allison Littlejohn [a], Colin Milligan [b]

[a] Open University, Milton Keynes, Buckinghamshire MK7 6AA, UK
[b] Caledonian Academy, Glasgow Caledonian University, Glasgow G4 0BA, UK
[c] Faculty of Education, University of Auckland, 74 Epsom Avenue, Epsom, Auckland 1023, New Zealand

ARTICLE INFO

Article history:
Received 5 June 2015
Received in revised form 20 October 2015
Accepted 22 October 2015
Available online 28 October 2015

Keywords:
Adult learning
Professional learning
Self-regulated learning
MOOCs
Online learning

ABSTRACT

Massive Open Online Courses (MOOCs) require individual learners to self-regulate their own learning, determining when, how and with what content and activities they engage. However, MOOCs attract a diverse range of learners, from a variety of learning and professional contexts. This study examines how a learner's current role and context influences their ability to self-regulate their learning in a MOOC: Introduction to Data Science offered by Coursera. The study compared the self-reported self-regulated learning behaviour between learners from different contexts and with different roles. Significant differences were identified between learners who were working as data professionals or studying towards a higher education degree and other learners in the MOOC. The study provides an insight into how an individual's context and role may impact their learning behaviour in MOOCs.

1. Introduction

Early enthusiasm, both from researchers and the mainstream media, surrounding the potential for Massive Open Online Courses (MOOCs) to 'revolutionise' and 'democratise' education has been replaced by growing concern that MOOCs have not had as profound or as fast an impact on education as initially anticipated (Daniel, 2012; Gillani & Eynon, 2014; OBHE, 2013). The reasons may be related to MOOC implementation (Mackness, Mak, & Williams, 2010). MOOCs are characterised by open access, learning at a distance (online) and scale. Key features include free registration, open access to learning (regardless of prior qualifications), a large and diverse learner body who not only have different backgrounds but also wide ranging motivations for enrolling in a course, and the absence of a single, linear learning progression followed by all students on a course (Breslow et al., 2013; Gaebel, 2013).

Despite these novel features, MOOCs tend to be structured as adaptations of conventional HE courses, adopting the same procedural metaphors as face-to-face courses but using technology, such as video recordings of lectures, to achieve scale (Fini, 2009). A study of the instructional design of 76 MOOCs revealed that MOOC design primarily concentrates on the organisation and presentation of course material, missing opportunities for new forms of interaction and feedback involving massive, diverse groups of people (Margaryan, Bianco, & Littlejohn, 2015). Investigations of learning in MOOCs have focused on what can easily be measured at scale, such as progression, retention and completion rates (Liyanagunawardena, Adams, &

* Corresponding author.
E-mail addresses: ninaehood@gmail.com (N. Hood), allison.littlejohn@open.ac.uk (A. Littlejohn), colin.milligan@gcu.ac.uk (C. Milligan).

http://dx.doi.org/10.1016/j.compedu.2015.10.019
0360-1315/

Williams, 2013), which give an understanding of the whole cohort but provide little insight into the behaviour of the individual. The openness of MOOCs and the resultant potential diversity of learners, each with different base-line knowledge and prior experience, makes the investigation of individual learners particularly important. More research is required, which focuses on the unique nature of learning and learners in MOOCs and examines the new methods of knowledge production and learning that MOOCs can support (Gillani & Eynon, 2014; Milligan, Littlejohn, & Margaryan, 2013; Veletsianos, Collier, & Schneider, 2015).

Learning in a MOOC differs from the pre-determined structure of conventional higher education (HE). The absence of interaction between the instructor and learners on a MOOC requires individuals to self-regulate their own learning, determining when, how and with what content and activities they engage (DeBoer, Ho, Stump, & Breslow, 2014; Kop, 2011; Mackness, 2013; Milligan & Littlejohn, 2014). Studies suggest that learners who are better able to self-regulate their learning, in either formal or informal settings (e.g. to support learning in the workplace), employ more effective learning approaches in online settings (Bernacki, Aguilar, & Byrnes, 2011). The ability to self-regulate one's learning is shaped by both personal-psychological and contextual factors (Zimmerman, 2000). Cognitive, affective and behavioural factors, such as interest in a task, self-efficacy, the ability to employ a range of learning strategies, self-reflection and self-satisfaction, all impact learning in a MOOC (Milligan & Littlejohn, 2015).

This study explores in detail how learners self-regulate their learning in a MOOC. The course was the 'Introduction to Data Science' MOOC offered by the University of Washington through Coursera. Participants in the MOOC came from diverse contexts, encompassing data science professionals, HE students and others learning for more general interest. Given the limited research to-date examining the effect of learner context on the learning strategies and behaviours employed in a MOOC, this study was structured around the research questions: *What self-regulated learning strategies do learners apply in a MOOC? and, How does a learner's current role influence their ability to self-regulate their learning in a MOOC?* The paper begins with an examination of the literature on self-regulated learning (SRL) in the online setting and how this literature relates specifically to MOOCs. This is followed by a description of the methods used to investigate the research questions, including an overview of the survey instrument employed in the study. The data analysis process and findings are then presented and discussed. The paper concludes by summarising the key findings and reflecting on the limitations of the study as well as potential directions for future research.

2. Literature review

MOOCs offer open, online learning at a massive scale. They operate as non-formal learning spaces (Colley, Hodkinson & Malcolm, 2002), where individual participants choose how, when and in what ways they engage. Typically content is disseminated through video-recorded lectures, which are accompanied by automated assessments and online discussion forums where learners can interact with other participants (but not the instructor). Researchers interested in investigating learning in MOOCs have utilised the vast amounts of data generated as learners participate in learning in MOOC environments (Breslow et al., 2013; Kizilcec, Piech, & Schneider, 2013), which enables tracking of the frequency and focus of learner engagement. Much of the research on learner behaviour has focused on understanding why completion rates are low (Jordan, 2014; Perna et al., 2014; Weller, 2014). The relationship between completion rates and learners' educational background, gender and geographic location have all been investigated (Breslow et al., 2013; Guo & Reinecke, 2014; Kizilcec et al., 2013). Yet there is little conclusive evidence that any of these factors explain learner behaviours and choices. Further research has investigated the connection between the nature of learners' participation in the online discussion forums and completion rates (Gillani & Eynon, 2014). This work uncovers the complexity around learner motivations, actions and behaviours in non-formal contexts. Not every MOOC participant is motivated to complete the course.

While online learning analytic data provides new insight into learners' actions in a MOOC, they provide little understanding of the learning dispositions or behaviours individuals bring to a MOOC, or how these characteristics help to shape their engagement and learning. The non-formal nature of MOOCs and the resulting non-linear navigation of most learners (Guo & Reinecke, 2014) combined with their massive scale, which limits personal interaction with the tutor, requires individual learners to have the necessary dispositions to structure their learning activities independently (Kop, 2011; Milligan & Littlejohn, 2015). However, with the broad range of participants MOOCs attract, there is wide variance in the ability of learners to self-regulate their learning (Milligan et al., 2013). Similarly, Gašević, Kovanović, Joksimović, and Siemens (2014) call for studies that explore learner behaviour in MOOCs arguing that because levels of tutor support are lower than in traditional (formal) online courses, there is a need for greater emphasis on the individual learner's capacity to self-regulate their learning.

Studies of self-regulated learning first emerged in offline (face-to-face) contexts in formal education. Self-regulation refers to 'self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals' (Zimmerman, 2000, p. 14). Zimmerman identified three phases of self-regulated learning – forethought, performance and self-reflection – and a number of sub-processes associated with each phase. The ability to self-regulate one's learning is mediated by both personal-psychological factors (cognitive and affective) and contextual-environmental factors. Self-regulated learning is not a fixed characteristic and an individual's self-regulation behaviour may change in different contexts. For example, in learning situations where the learner is more motivated and interested or in contexts where the learner feels more confident he or she may be more self-regulated (Pintrich, 2000).