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Conscientious Behaviour, Flexibility and Learning in Massive Open On-Line Courses

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Abstract

Since 2011 the growth in Massive Open Online Courses (MOOCs) has been so enormous that, according to the Economist magazine, "the ivory towers of academia have been shaken to their foundations" (2013). One proposed benefit of MOOCs is that they allow considerable flexibility in organizing learning. At the same time, there is evidence that learning is associated with conscientiousness (O'Connor and Paunonen, 2007), especially planning, self-discipline and organization. This may be even more important in flexible courses than in traditional learning. This study explored the impact of conscientious behavior in a MOOC on student completion. Data from 27,993 students on a course was analyzed (including only those who watched at least one lecture and/or submitted at least one assignment). Students engaging with the course at roughly the same time every week were regarded as showing planning and self-discipline (high conscientiousness) and an index of regularity was developed. The association of this regularity with course completion was assessed. The results showed a moderately strong and highly significant association (chi-square = 1205.4 (5), $p < .001$), Cramer's V = .324. This suggests the flexibility of MOOCs may be of most benefit to those with conscientious study practices. The development of tools which help students to plan and develop conscientious practices may well aid student completion and learning in MOOCs.

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Keywords: Higher education, conscientiousness, Massive Open Online Courses (MOOCS), distance education, metacognition

1. Introduction

Massive Open Online Courses (MOOCs) have been one of the major developments in higher education over the last three years. From the time that the first truly massive course was launched in Stanford in 2011, higher education has seen the foundation of a number of different providers of MOOCs including Udacity, Coursera, and

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EdX. In December 2013, Coursera alone was able to boast of 549 courses, provided by 107 leading universities, and over 5 million student registrations. MOOCs were originally announced as the death knell for the lecture (Koller, 2011) and it was no surprise that, in July 2013, the Economist magazine reported, "Since the launch early last year of Udacity and Coursera, two Silicon Valley start-ups offering free education through MOOCs, massive open online courses, the ivory towers of academia have been shaken to their foundations". One of the defining features of MOOCs is that they are intended to be flexible, catering for people who do not have the time, money or freedom to attend traditional higher education. Coursera, for example, describes itself as enabling people to "learn without limits" and highlights that it is designed for those who are busy with many demands on their time (Coursera, 2013). Daphne Koller, one of the founders of Coursera has highlighted that, "the flexibility that students have with online courses allows them to complete assignments at a time and place that is more convenient to their lifestyle" (Levi, 2013). Yet, it is open to ask if learners are always equipped to manage the flexibility and openness that MOOCs provide. In particular the way in which a person plans and organises themselves (the personality trait called conscientiousness) is likely to have an impact on their learning (O'Connor and Paunonen, 2007). While traditional higher education provides considerable structure for the learner (in the form of timetables and clear deadlines), MOOCs allow much greater flexibility. This may be a challenge for learners, as much as a benefit. In this study we sought to explore the impact of conscientiousness on completion rates in a MOOC called 'Introduction to Computer Programming in SCALA' offered by the École polytechnique fédérale de Lausanne (EPFL) in 2012. While personality traits like conscientiousness are often measured using self-report scales, the record of learner activities gathered within a MOOC allowed us to look at students' actual actions (rather than their self-report of what they would normally do). Students who typically watched videos on the same day each week were regarded as showing evidence of planning and self-discipline (two aspects of conscientiousness). The association of this measure of conscientiousness with completion of the MOOC was assessed.

2. Context of the Research

2.1. Massive Open Online Courses

Although the term MOOC existed previously, the first really Massive Open Online Courses were delivered from Stanford University as recently as 2011, when three computer science courses delivered on an open on-line platform attracted 300,000 registrations (Koller, 2011). Almost immediately there were claims that MOOCs would revolutionize higher education, and would ultimately replace most universities as we know them today (Schuman, 2013). The New York Times declared 2012 to be "the year of the MOOC". MOOCs come in many forms, but typically they offer short video lectures, combined with quizzes and exercises which give the learner opportunities to get feedback on their progress. They also use social media tools such as forums to allow learners to interact with each other and to support each other's learning. There is typically no rigid timetable – videos and other materials are made accessible on a regular (usually weekly) basis and students are encouraged to follow them regularly, but they remain accessible during the course period and so someone can follow the course 'out of step' with other participants. The flexibility of the platform is seen as a major bonus, allowing people who would not otherwise be able to take a course to access it through a MOOC. Yet, very quickly, questions were asked about the high drop-out rates from MOOCs. Clow (2013) identified that this rate is something of the order of 80%-90% and uses the metaphor of 'funnel of participation' to conceptualize the steep drop-off in activity. The number of people who are aware of the course is greater than the number who registers for it. The number of people who register is higher than the number who watches the first video. The number that undertakes exercises and participates in community interaction is lower still. The number who completes the course is lower again. For some this steep drop off rate is not a significant problem. Lukeš (2012) identifies that, while one of the first MOOCs (the Stanford Artificial Intelligence course) had a drop of rate of 85%, this still left 23,000 people completing the course – 10,000 more than the total number of students actually enrolled in Stanford at the time. Yet, many of the almost 140,000 people who dropped out of this course undoubtedly invested time and energy in the course. With the added scale of MOOCs must come an added responsibility not to waste students' time. It is worth, therefore asking, what features are associated with increased likelihood of completion of a MOOC. MOOCs can help to answer this question. As Koller (2011) has noted, the online format provides a window on what works: "Online technology can capture every