Goal Setting and Striving in MOOCs: A Peek Inside the Black Box of Learner Behaviour

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Abstract. Reaching goals can be challenging, especially if they are not in the near future like with learning in MOOCs. The aim of this explorative study was to get insight in this goal achievement process, which can help to understand learner behaviour. Two research questions were examined namely: (1) what goals do learners set, and do they succeed in reaching these goals? and (2) how does the course of action of several learners look taking Gollwitzer's Rubikon model of action phases as a guideline? We found that even though learners did not achieve the goals they set, they were still generally satisfied with the knowledge they gained. In addition, learners went more or less intuitively through the theorised action phases, yet typically did not take the time to deliberately plan (before the start) and evaluate (after finishing) their learning process. This insight can serve as starting point for developing supporting tools for learners and personalised dashboards, which can offer the tools at appropriate times in a learner's course of action.

Keywords: MOOCs · Online learning · Goal setting · Goal striving · Goal achievement

1 Introduction

Reaching goals can be challenging, especially if a goal is not in the near future [1] like with learning in MOOCs. Since the appearance of the MOOC, many studies focused on learner retention and behaviour as a way to unravel the success or failure of MOOCs [2]. In these studies completion of the course and acquisition of a certificate predominates as the expected main goal of learners. Gradually scholars agreed that due to the exceptional learning circumstances learners can have alternative learning goals in MOOCs and that there are a variety of goals learners can intend to achieve [3–5].

Yet, despite the vast and increasing amount of research about MOOC-learning covering many different topics [6], there are still important issues which need to be addressed in order to further our understanding of MOOC-learning. One of these issues concerns the course of action learners undertake after they decide they want to gain certain knowledge or skills. This starts with a learner's wish for (certain) knowledge and ends with the evaluation of the outcome [1]. Gollwitzer [1] proposes the Rubikon model of action phases to get insight into the processes involved in achieving goals.

This 4-phase model addresses questions like how individuals choose their goals (goal setting), how they plan and enact on the execution of these goals (goal striving) and how they evaluate their efforts.

Insight in the complete goal setting and goal striving process will help to understand learner behaviour in MOOCs and subsequently to develop useful interventions to support learners in this process. This paper presents an overview of a first explorative study explaining learner behaviour in MOOCs taking the Rubikon model of action phases as a theoretical guideline. The research questions that will be answered are: (1) what goals do learners set, and do they succeed in reaching these goals? And (2) How does the course of action of learners look?

2   The Rubicon Model of Action Phases

According to Gollwitzer [1, 7] a course of action (i.e. the process of forming an intention to evaluating actual behaviour) is a "temporal and horizontal path" (p. 6), that can be divided into 4 phases: (1) the predecisional phase, (2) the preactional phase, (3) the actional phase and finally the (4) postactional phase (see Fig. 1). Each phase is marked by a transition point; the end of the pre-decisional phase is marked by setting a goal, the end of the preactional phase is marked by planning on how to reach this goal and the initiation of actions and the end of the actional phase is marked by evaluating the achieved outcomes (see Fig. 1).
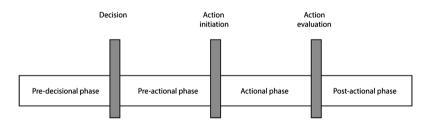

Fig. 1. The Rubikon model of action phases [1]

In the pre-decisional phase, which is about deliberating and weighing the different options an individual might have [1, 7], a specific goal is set or in other words a goal intention is formed. Translated to learning in MOOCs this means that a potential MOOC-learner might contemplate whether a MOOC fits his/her needs and wishes for gaining certain knowledge and subsequently decide to enroll. Furthermore, based on the available information about the content of the MOOC, learners will make a (first) decision about what they intend do in the MOOC. This may vary from the intention to browse to finish one or more modules to completing the course and getting the certificate. Due to the open accessible nature of MOOCs, learners can formulate their own individual intentions.

The preactional phase is about planning concrete strategies for achieving the set goal. Ideally a MOOC-learner should address issues like when, where and how

learning will take place to strengthen the attainment of the specified goal intention and what action to take if something interferes with this initial planning [1, 7]. This is particularly important if multiple steps are needed to achieve the desired goal, or if a set goal cannot be reached in the near future [1]. The formulation of when, where, how plans is generally referred to as forming implementation intentions [8]. Implementation intentions have the purpose to shield a learner from getting distracted from unwanted and/or anticipated disturbances. The rationale is that by formulating if…then questions, anticipating issues that could hinder goal attainment, the chance of reaching the goal will increase. For example, if X happens, then I will perform goal-directed response Z [1, 7]. Also, the strength of the goal intention (how determined is someone to reach the intended goal) and the perceived behavioural control (someone's perception of the degree of control (s)he has over performing a behaviour) will have an effect on goal attainment [8, 9].

The actional phase revolves around enacting the strategies which were planned in the preactional phase in pursuit of goal achievement [1, 7]. During this phase, various disturbances may be encountered that can delay or even prevent individuals from reaching their goals. In MOOCs these disturbances, or barriers as they are generally referred to, can be either MOOC-related like or non-MOOC related [10, 11]. Typical MOOC- related barriers often mentioned by learners are lack of interaction, lack of instructor presence and bad course content [10]. Examples of Non-MOOC related barriers are insufficient academic knowledge, lack of time and technical issues like bad internet or lack of digital skills [10]. Depending on the strength of the goal commitment and whether the individual was sufficiently shielded from these barriers, the intended outcome will be achieved to a greater or lesser extent.

In the final phase, the postactional phase, an evaluation takes place of whether the goal striving has succeeded [1, 7]. This success depends on two criteria. The first criterion is whether the individual goal intentions, which were formed in the predecisional phase are achieved. Did the MOOC-learner achieve the goal that (s)he intended to achieve? According to Henderikx, Kreijns and Kalz [3] this can result into three different (goal) intention –behaviour (achievement) patterns: (1) the learner achieved the intended goal (inclined actor), (2) the learner did more than intended (disinclined actor), (3) the learner did not achieve the intended goal (inclined abstainer). The second criterion which must be addressed when evaluating the achieved outcome is whether the achievement matches the expectation. In other words, is the result of the goal striving in sync with the expected value. After finishing learning in the MOOC, a learner will assess whether the learning gains met expectations and satisfied all the learning needs. A proper postactional evaluation will benefit future deliberation and planning needs.

According to Gollwitzer [1, 7], there are some issues regarding the goal setting and goal striving process, as visualised in the Rubikon model of action phases, that need to be taken into consideration. Firstly, not every initiation of action is preceded by careful deliberation, and goal setting (forming a goal intention). Secondly, formation of a goal intention is not always followed by concrete planning i.e. forming implementation intentions. Thirdly, overlap between action phases is possible. In some cases, a course

of action can be an iterative process. Fourthly, the decision points in the model, which mark the end of the phases do not represent points of no return, yet points of putting deliberation to rest and commitment to pursue a set goal.

3   Method

3.1   Participants

Participants took part in a MOOC about 'Governing climate change; Polycentricity in action'. The MOOC was designed by respective teams at the Open University of the Netherlands in cooperation with external parties. None of the authors was involved in the design of the course. The MOOC ran from September 2018 until the end of October 2018, covering 10 units in 8 weeks and the estimated study load was 4–5 h per week. A total of 49 learners enrolled in this MOOC of which 22 learners completed the pre-course survey (16 females, 6 males, M_{age} = 38,4 years, age range: 22–62 years, St_{dev} = 16,8). The post-course questionnaire was completed by 13 learners (11 females, 2 males, M_{age} = 36,4 years, age range: 22–62 years, St_{dev} = 11,8). In addition, 5 learners, 4 females and 1 male (M_{age} = 28,8 years, age range: 24–33 years. St_{dev} = 3,4) were recruited using convenience sampling, to provide additional in-depth information in the form of interviews.

3.2   Materials

To measure individual goal setting and goal striving a self-constructed set of items was used which was aligned with the design of the respective MOOC following Henderikx, Kreijns and Kalz [3]. Items covered increasing goal intentions from browsing, participation in one or more units, up to participating in all learning activities and requesting a certificate. These items were included in both pre- and post-course surveys of the MOOC. In the post-course survey learners were asked to indicate their actual goal achievement on the same set of items used in the pre-course survey taking into account the methodological issues of scale correspondence [12]. In addition, the pre-course survey included several general questions on gender, age, educational background, employment status and online learning experience and the post-course survey included additional questions about the perceived value of the learning and course satisfaction.

   To gain deeper insight in the goal setting and goal striving process of the learners, a self–constructed set of open questions was formulated based on the Rubikon model of four action phases [1, 7, 8] for the purpose of face-to-face or email interviews. Example questions are: 'Were you looking for a MOOC specifically about this subject?' and 'Were you able to learn in the MOOC according to your plan?'. Questions regarding (perceived) control were derived from Fishbein and Ajzen [9]. An example question is: 'Were you confident that you would reach your learning goals?'.

3.3   Procedure

In the first week of the MOOC, all the registered learners received an invitation via the open source online survey tool Limesurvey (visit http://www.limesurvey.org), to participate in the pre-course questionnaire. At the end of the last week, again, all registered learners received an invitation via Limesurvey, to participate in the post-course questionnaire. Participation was on a voluntary basis and filling out the questionnaire took approximately 5 min.

Two weeks after the runtime of the MOOC all registered learners received an invitation via email to provide more in-depth information about their goal setting and goal striving process in the MOOC in the form of an interview, either face-2-face, via email or via a videoconferencing application. It was emphasised that it was not necessary to have finished the course or completed any of the surveys.

4   Results

4.1   Goal Setting

In the first phase, the predecisional phase the goal is set. Figure 2 shows that most learners in the MOOC indicated that they set the goal to complete the MOOC (23%) and request the certificate (45%).
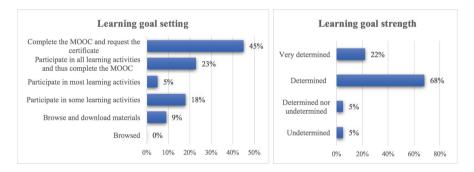

Fig. 2. Goal setting (N = 22) and goal strength (N = 22, 5-point Likert scale)

They also indicated that they were generally determined (68%) or very determined (22%) to reach this goal (see Fig. 2). Additionally, besides the content-oriented goals which were set, learners indicated alternative goals which were important for them. Seeking connection with other learners on the topic of climate change (39%) and finding collaboration possibilities with other organisations on climate change issues (36%) were mentioned most (see Fig. 3).
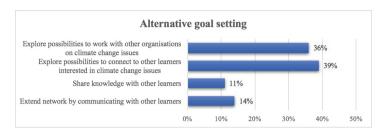
Fig. 3. Alternative goal setting (N = 22)

4.2   Goal Achievement

In the postactional phase an evaluation takes place of whether the goal striving actions were successful. At first, it was evaluated if the content-oriented goal, which was set in the predecisional phase, was achieved. Figure 4 shows that 23% of the learners completed the MOOC and that the majority of the learners merely participated in some (46%) or most learning activities (15%).
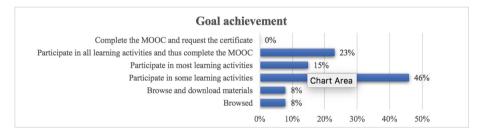

Fig. 4. Goal achievement (N = 13)

Yet, achievement reaches further than the mere quantitative measurement of the content-oriented goals. Therefore, it was additionally evaluated if the achieved outcome matched the expectation, which can be characterised as a form of subjective evaluation of achievement. The majority of the learners indicated that they achieved their personal goals to some extend (46%) or a great extend (15%), that their expectations were met to a great extend (46%) or completely (7%) and that they were satisfied (54%) or very satisfied (7%) with the course (see Fig. 5).
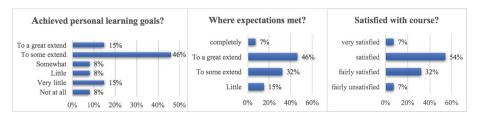

Fig. 5. Subjective evaluation of achievement, expectations and satisfaction (N = 13, 7-point Likert scale)

In-depth interviews were conducted to give additional insight into the courses of action these learners followed, how they progressed through the goal setting and goal striving process and how their subjective value judgements are substantiated.

4.3   Qualitative Results

The post-interviews were analysed using deductive thematic analysis [13] and were coded for themes derived from the theoretical framework of the Rubikon model of action phases [1].

The interviewees rated their English proficiency as good to very good and all of them had a master degree. In addition, each of them had previous experience with learning in MOOCs. All but one set the goal to complete the MOOC and all of them indicated that they were determined to very determined to reach their set goals. In addition to their set learning goals they also specified that they wanted to share knowledge with other interviewees, explore possibilities to connect to other people who are interested in climate change issues and explore possibilities to work with other organisations on climate change issues.

4.4   Predecisional Phase

In this phase, different options are deliberated and weighted and a specific goal is set [1, 7]. All five of the interviewees indicated that they were not specifically looking for a MOOC, but merely for information and learning possibilities regarding the topic of climate governance and polycentricity: "I stumbled across it when I was looking for information on polycentric governance" (P2) and "…In fact, I was not actively searching for a MOOC" (P5).

In addition, neither of them knew whether there were more MOOCs available on this specific topic. As soon as they came across this specific MOOC, they did not search any further for alternative learning options. Before making the decision to enroll, all of them evaluated the specified weekly workload of the MOOC, yet only one interviewee stated that the workload actually influenced his decision to sign up, as he wanted to make sure that he would able to follow the MOOC next to his normal daily workload. The other four interviewees did think about their available time for learning in the MOOC, but did not let this influence their decision: "I knew that I would not be able to complete it, because I was on field research that time, but I still enrolled to look at it" (P2) and "When I enrolled in the course I was not yet sure whether I would have time to participate in the MOOC" (P3).

All interviewees but one signed up for the MOOC immediately after they found the MOOC and read the available information. One interviewee first sent an email to the MOOC organisers to ask for any formal requirements and signed up after receiving an answer.

4.5   Preactional Phase

This phase is about planning concrete strategies for achieving the goal set in the predecisional phase [1, 7]. Three of the interviewees specifically spend time thinking

about planning their learning and indicated that they would generally learn at home after work and during weekends. However, most of the interviewees did not think about issues that could hinder their learning and thus did not make alternative (shielding) plans in advance. Only one interviewee indicated that he specifically thought about issues in his personal environment that could hinder him successfully reach his set goal intention: "I figured that if I would not be able to study on a certain day, or would not have sufficient time, instead of working smarter or harder, I would just have to work longer" (P5).

Three of the interviewees were confident that they would reach their learning goals and two of them were not sure about it. One of the interviewees stated that a previous experience with a MOOC made her uncertain: "I had done another MOOC in the spring, one that even cost money, but I could not motivate myself to finish. So, I was unsure if I would be able to hold on [in this MOOC]" (P4).

The opinions of the interviewees are divided regarding their own responsibility for reaching their goal intentions. Some of them are very determined that it is totally up to the learner, some are not sure and one of them feels that it also depends on the course design and the feedback of the instructors.

4.6   Actional Phase

This phase is about enacting the strategies which were planned in the preactional phase in pursuit of goal achievement [1, 7]. Two interviewees indicated that they learned according to their plan. Another two interviewees were not able to study as planned due to circumstances and one interviewee stated that she kind of learned as planned: "as I did not have a real plan, but I did have time… to look into it once in a while" (P2).

While acting in this phase in pursuit of their set goals, two of the interviewees deliberately changed their set goal intention because their interest changed and they did not like the method of learning (online as opposed to face-to-face) which made them lose motivation and ultimately quit the MOOC after several weeks. Yet, one of the interviewees specifically indicated that: "the quality (content) and quantity (workload) were not the reasons why I dropped out" (P3).

4.7   Postactional Phase

In this final phase, the achievement of the individual goal intentions is evaluated [1, 7]. None of the interviewees consciously took the time to evaluate their achievement. Yet, when specifically asked about it, four interviewees stated that they did not reach their initially set goals, yet at the same time all five of the interviewees were mostly satisfied with the knowledge they gained: "Even if I didn't reach the goal completely, there was a lot of learning involved" (P1). One of the interviewees added that although she gained the knowledge she aimed for, she was not happy with the amount of time she had to spend on it: "but [I] do not feel satisfied with the knowledge I gained versus the time I invested" (P4).

Further evaluation whether the achieved outcome was in line with the expected value was also very positive. One source of some dissatisfaction was the lack of interaction in the course" "the instructors had little participation. At some point, it

seemed like the course was "abandoned" (P1) and "too little discussion took place in the discussion forum. … I had hoped to learn much more from others' experiences and thoughts on the course" (P5). Overall, all interviewees indicated that the MOOC met their expectations. Most important aspects for this value judgement were content, theoretical deepening, usefulness for practice and flexibility of the MOOC.

5   Discussion

The aim of this explorative study was to get a deeper understanding of learner behaviour in MOOCs. We examined two research questions namely (1) what goals do learners set, and do they succeed in reaching these goals? and (2) How does the course of action of learners look? Regarding the first research question we found that the majority of the participants (90%) wanted to finish the MOOC, with or without requesting a certificate. They also indicated that they were determined or very determined to do so. In addition, besides the content orientated goal they set, most of them had some alternative goals which were mainly to connect with other participants in the course and to explore possibilities to work with other organisations. The goal achievement results showed that only 23% of the participants did reach their initially set goals, yet 61% indicated that they achieved their personal learning goals and over 50% indicated that their expectations were met and that they were satisfied with the course. This was confirmed by the interviewees who all but one did not achieve their set goals, yet who were overall satisfied with the knowledge they gained. The apparent discrepancy might be explained by the broad learning opportunities MOOCs provide. The individual learning can go beyond course content related learning and also include alternative goals participants set for themselves at the start of the course or somewhere along the way. Another explanation can be the dynamicity of the intention-behaviour process [11]. Learners may change their intention (set goal) while learning in the MOOC due to various circumstances [11]. As this happens after they start learning in the MOOC, changes of goal setting are very difficult to determine, but should still be taken into consideration when evaluating learner success in MOOCs.

In answer to the second research question, we found that the interviewed learners more or less intuitively went through the action phases as theorized by Gollwitzer [1, 7], touching upon the transition points (setting the goal, planning how to reach the goal and initiate action and evaluating the achievement) to a greater or lesser extent. All of the interviewees set their goals before the start of the MOOC, yet neither of them weighted or deliberated different options or let the indicated workload and their individual available time influence their decision. Once they came across the MOOC, they basically immediately signed up. Some of the interviewees did spend time thinking about the planning of their learning, however they did not anticipate issues that could hinder their learning. While learning in the MOOC some of the interviewees changed their initial set goal or quit the MOOC and after finishing the MOOC neither of them consciously took the time to evaluate the process. This is somewhat surprising, especially as one interviewee stated that a negative experience with a previous MOOC made her feel unsure about reaching her learning goal this time.

These transition points might be the key to supporting a successful learning experience. A well-thought-out planning, also anticipating issues which could hinder the learning process can contribute to achieving the set goals [8]. Evaluation of the learning process after finishing learning in the MOOC in the sense of reflecting on the process and determining why negative as well as positive outcomes happened will benefit future deliberation and planning needs [1, 7] and take away unnecessary uncertainties.

This study has several limitations. One important issue is that the current sample is very small. Another limitation is that the topic of the MOOC is very specific, thus the findings are context-specific. Also, due to convenience sampling, the interviewees were moderately representative for the participant population. Needless to say, that more research is necessary to establish learner behaviour patterns in courses of action in various MOOCs, which can then serve as starting point for developing learner supporting tools and personalised dashboards, which can offer the tools at the appropriate moments in a learner's course of action.

References

1. Gollwitzer, P. M.: Action phases and mind-sets. In: Handbook of Motivation and Cognition: Foundations of Social Behavior, vol. 2, pp. 53–92 (1990)
2. Veletsianos, G., Shepherdson, P.: A systematic analysis and synthesis of the empirical MOOC literature published in 2013–2015. Int. Rev. Res. Open Distrib. Learn. **17**(2), 67–90 (2016)
3. Henderikx, M., Kreijns, K., Kalz, M.: Refining success and dropout in MOOCs based on the intention-behavior gap. Distance Educ. **38**, 353–368 (2017)
4. Koller, D., Ng, A., Do, C., Chen, Z.: Retention and intention in massive open online courses: in depth. Educ. Rev. **48**(3), 62–63 (2013)
5. Reich, J.: MOOC completion and retention in the context of student intent. Educause Review Online, 8 December 2014. http://er.educause.edu/articles/2014/12/mooc-completion-and-retention-in-the-context-of-student-intent
6. Zawacki-Richter, O., Bozkurt, A., Alturki, U., Aldraiweesh, A.: What research says about MOOCs–an explorative content analysis. Int. Rev. Res. Open Distrib. Learn. **19**(1), 242–249 (2018)
7. Gollwitzer, P.M.: The goal concept: A helpful tool for theory development and testing in motivation science. Motiv. Sci. **4**(3), 185–205 (2018)
8. Gollwitzer, P.M.: Implementation intentions: strong effects of simple plans. Am. Psychol. **54**(7), 493–503 (1999)
9. Fishbein, M., Ajzen, I.: Predicting and Changing Behavior: The Reasoned Action Approach. Taylor & Francis, Milton Park (2011)

10. Henderikx, M., Kreijns, K., Kalz, M.: A classification of barriers that influence intention achievement in MOOCs. In: Pammer-Schindler, V., Pérez-Sanagustín, M., Drachsler, H., Elferink, R., Scheffel, M. (eds.) EC-TEL 2018. LNCS, vol. 11082, pp. 3–15. Springer, Cham (2018). https://doi.org/10.1007/978-3-319-98572-5_1
11. Henderikx, M., Kreijns, K., Kalz, M.: Intention – behaviour dynamics in MOOC learning. What happens to good intentions along the way? In: Castro, M., Tovar, E. (eds.) Proceedings of the Fifth Learning with MOOCs Conference, pp 110–112. IEEE, Madrid (2018b). https://doi.org/10.1109/lwmoocs.2018.8534595
12. Sutton, S.: Predicting and explaining intentions and behavior: how well are we doing? J. Appl. Soc. Psychol. **28**, 1317–1338 (1998)
13. Braun, V., Clarke, V.: Using thematic analysis in psychology. Qual. Res. Psychol. **3**(2), 77–101 (2006)