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Confidence Counts

Fostering Online Learning Self-Efficacy with a MOOC

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The increasing reliance on online learning in higher education has been further expedited by the on-going Covid-19 pandemic. Students need to be supported as they adapt to this new learning environment. Research has established that learners with positive online learning self-efficacy beliefs are more likely to persevere and achieve their higher education goals when learning online. In this paper, we explore how MOOC design can contribute to the four sources of self-efficacy beliefs posited by Bandura [4]. Specifically, we will explore, drawing on learner reflections, whether design elements of the MOOC, *The Digital Edge: Essentials for the Online Learner*, provided participants with the necessary mastery experiences, vicarious experiences, verbal persuasion, and affective regulation opportunities, to evaluate and develop their online learning self-efficacy beliefs. Findings from a content analysis of discussion forum posts show that learners referenced three of the four information sources when reflecting on their experience of the MOOC. This paper illustrates the potential of MOOCs as a pedagogical tool for enhancing online learning self-efficacy among students.

1 Introduction

Online and technology-enhanced learning have been gaining increasing importance in higher education and have, to varying degrees, become integral components of curriculum and instruction. This trend accelerated dramatically in 2020 when the Covid-19 pandemic forced higher education institutions across the globe to rely solely on remote teaching and learning. With little to no preparation students all over the world were tasked with starting and continuing their higher education online. These unprecedented circumstances highlighted the importance of supporting students adapt to the challenges and demands of online learning.

Central to the process are student self-efficacy beliefs towards learning online. Online learning self-efficacy refers to one's confidence to perform learning-related

tasks successfully in an online environment. This definition of self-efficacy is based on the work of Bandura [3], Bandura [4], and Bandura [1]. Self-efficacy has been shown to be related to human behaviour and pivotal in various valued outcomes. For example, studies have shown that self-efficacy is related to motivation, self-regulatory learning processes, and achievement across a wide range of academic domains and learning contexts [15]. Students with high levels of self-efficacy are often motivated, self-directed, persist in the face of difficulties, and tend to have high goal achievement [2, 8, 12]). This research suggests that in order to improve the success of the pedagogical interventions commonly used by educational institutions to support knowledge and skill development among students, they should focus on the development of students' self-efficacy beliefs.

Massive Open Online Courses (MOOCs) are one avenue through which pedagogical interventions can be offered at scale. Studies have suggested several ways to support self-regulated learning (e.g. [9, 10]) and self-efficacy more specifically [6] through MOOC design. In addition, Rodriguez and Armellini [13] demonstrated using a pre-test/post-test research design that their study skills MOOC was successful in significantly increasing learners' levels of self-reported self-efficacy. In an extension of this work, the current paper focuses on the MOOC, *The Digital Edge: Essentials for the Online Learner*, a pedagogical intervention designed to assist students to learn how to learn online. By drawing on qualitative feedback posted by participants in the course discussion forum, this paper explores how the design and implementation of the MOOC can support learners develop positive self-efficacy beliefs towards online learning.

2 Sources of Self-efficacy

Central to social cognitive theory, Bandura [4] proposed that individuals develop self-efficacy beliefs through a combination of the following: i) enactive mastery experiences, ii) vicarious experiences, iii) verbal persuasion, and iv) physiological and affective sources.

2.1 Enactive Mastery Experiences

An individual's prior experiences with the task at hand, or a similar task, can serve as an indicator of capability. Past successes can build confidence, while failures can weaken it. The difficulty of a task and the amount of effort required also contribute to a person's sense of self-efficacy. Enactive mastery experiences are determined to be the most influential source of efficacy information as they are

accomplishments that we have experienced ourselves, for which we have tangible experiential evidence of success [2].

2.2 Vicarious Experiences

Social comparisons allow individuals to perceive their abilities in relation to the successes or failures of others, such as peers and role models. Observing others, with whom they can identify, succeed at a task can provide individuals with a sense of confidence in their own ability to perform similar tasks [2].

2.3 Verbal Persuasion

Verbal persuasion refers to positive encouragement and feedback from others. Realistic affirmations from others can boost self-efficacy perceptions. Verbal persuasion is often considered to be a weaker source of self-efficacy as compliments can often be given loosely without substantiation [2].

2.4 Physiological and Affective Sources

Self-efficacy beliefs or perceptions of ability can also be influenced by our body's physical and emotional reactions to certain situations and tasks. Experiences of anxiety, stress, arousal, fatigue, for example, and their accompanying physical manifestations, can leave a student with a low perception of their ability to persist in a task.

3 Mooc Design and Self-Efficacy

The Digital Edge: Essentials for the Online Learner, is a MOOC offered by Dublin City University (DCU) in collaboration with the Irish Universities Association and DCU's Students Union. The main goal of the MOOC is to support college and university students around the world to learn how to be effective online learners given the challenges facing them as a result of the Covid-19 pandemic.

The course, which is hosted on the FutureLearn platform, is two-weeks long and consists of approximately 3 hours of learning per week. The content is structured around four main themes: Ways of Thinking and Ways of Working (Week 1), Tools for Working and Tools for Thriving (Week 2). The pedagogical design of the MOOC draws on the LifeComp Framework [14], the Learning Compass 2030 [11] and the Conversational Framework [7], which is the underlying pedagogical framework of the FutureLearn platform. A unique aspect of the MOOC is that it was co-designed

and -facilitated by experienced online learners. The first iteration of the course was launched in September 2020 with over 7,800 enrolments. Table 1 outlines how the pedagogical strategies in the course were intended to support online learning self-efficacy development.

Which of the following aspects of online learning are you most concerned about?

○ Staying focused and self-motivated

○ Lack of social interactions

○ Lecturers experience in online teaching

○ Internet speed/ availability

○ Limited access to lecturers/ tutors

○ Organising group work/study sessions

○ Limited access to lecturers/ tutors

○ Access to computers/ technology

○ Other

Which of the following statements best describes how you are currently feeling about being an online learner?

○ I'm feeling happy

○ I'm feeling anxious

○ I'm feeling excited

○ I'm feeling angry

○ I'm feeling unhappy

○ I'm feeling overwhelmed

○ I'm feeling comfortable

Figure 1: In-course poll examples

4 Analysis of Learner Reflections

A theory driven, deductive content analysis of discussion forum posts was conducted to identify if learners reported on these four information sources when reflecting their experience of the MOOC. Data was obtained from the final step in the MOOC. In this step, learners were encouraged to share their experience and thoughts on the course as a whole. This step contained a total of 353 independent learner comments.

In the first phase of the analysis, 187 posts were coded as containing substantive learner reflections of the course. All other comments (N = 166) were excluded from further analysis because they were either too short or were not a reflection. For instance, many of the excluded comments were simply a "thank you" to the

Table 1: Sources of self-efficacy development in the MOOC

Information Source	Relation to MOOC
Enactive mastery experiences	The MOOC itself was an authentic online learning experience. Participation in an online course can give students tangible evidence that they can learn successfully online. It was expected that the non-formal, low risk nature of the course would encourage participation, even among less experienced learners.
Vicarious experiences	The MOOC was co-designed and -facilitated by students who had prior experience learning online. Participant's vicarious experience was encouraged through the use of real-life examples and testimonials from these students. Testimonials were included in the course content as quoted text and audio clips. Student facilitators were also available for the 2 weeks to answer questions and share their experiences in the discussions forums at the end of each step. Participants were encouraged to ask questions and draw on the knowledge and experience of the student facilitators. By observing the successes of their peers, learners can generate efficacy beliefs that they too can obtain success through persistence and effort.
Verbal persuasion	Positive verbal persuasion was provided through the discussion forums by both the instructors and the student mentors to help participants believe that they can cope with difficult situations when learning online.
Physiological and affective states	Well-being, emotional regulation and co-regulation were key components of the pedagogical framework of this MOOC. Polls incorporated at four points throughout the course encouraged learners to reflect and share how they were feeling about learning online (See Figure 1). The poll format allowed participants to respond anonymously while also being able to see how their peers were feeling.

instructors. Next, a more detailed qualitative analysis was conducted to identify self-efficacy-related appraisals relating to the four sources of self-efficacy. Five coding categories were formulated, one for each of the four sources of self-efficacy and an additional category for other. All 187 comments were coded and assigned to these five categories. The results of this categorisation are presented in Table 2 and Table 3 provides exemplar comments from each category.

Table 2: Classification of learner reflections

Source	N	%
Enactive mastery experiences	37	20
Vicarious experiences	5	3
Verbal persuasion	0	0
Physiological and affective states	33	17
Other	112	60

The results show that learners referenced three of the four information sources when reflecting on their experience of the MOOC. In particular, the participants reported that the MOOC was a form of enactive mastery experience and that it encouraged positive physiological and affective states. No reflections were classified as referring to "verbal persuasion". This may be because learners usually receive feedback on an individual basis and may not deem it relevant when reflecting on the course as a whole. It may also be the case that the role of feedback is difficult to identify in comments as it could be implied by more general statements such as "the course was encouraging". More research is needed to investigate this further. It is also noteworthy that the majority of the reflections were classified as "other". These comments generally focused on knowledge and skill attainment owing to the course content. While improvements in knowledge and skill may influence one's self-efficacy beliefs, they are difficult to categorise according to Bandura's [4] constructs.

5 Conclusion

Self-efficacy plays an important role in learning success. Thus, online learning self-efficacy constitutes an important area of interest for higher education institutions, particularly in the context of Covid-19, where the majority of teaching and learning is taking place remotely. The current paper contributes to the literature by

Table 3: Examples of learner self-efficacy feedback categorised by source

Enactive mastery experiences	*A great confidence booster in an Unfamiliar environment –* Learner A *This course helped introduce me to what learning online will be like. It has helped me understand it better and I feel more confident now that I have completed the course* – Learner B
Vicarious experiences	*This course was very helpful and encouraging. I thought the reflections by student ambassadors were reassuring and have made me a little bit more confident about the learning that lies ahead.* – Learner C *I feel a lot more comfortable about online learning after finishing it. Seeing other students' opinions and experiences in the comment section also really helped me.* – Learner D
Physiological and affective states	*I am now excited to start studying my course whereas last week I was more anxious.* – Learner E *After completing this course my level of anxiety definitely went down* – Learner F
Other	*This course has been very informative and helpful and i look forward to using the tips I've learned during my online learning.* – Learner G *It gave me plenty of new resources to use that will help with my college experience.* – Learner H

illustrating how MOOC design and implementation can contribute to the sources of self-efficacy beliefs posited by Bandura [4]. Previous research has shown that self-efficacy can be improved as a result of completing a course [5, 13]. However, more qualitative and quantitative research is needed to build on the findings of the current study and explore further the relationship between MOOC design and online learning self-efficacy.

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