DESIGNING MOOCS TO FACILITATE PARTICIPANT SELF-DIRECTED LEARNING: AN ANALYSIS OF INSTRUCTOR PERSPECTIVES AND PRACTICES

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This mixed methods study examined instructors' perceptions of self-directed learning (SDL) and the design of MOOCs to facilitate student SDL. Four instructors were selected for Zoom interviews and their MOOCs were reviewed to inform the questionnaire design. An online questionnaire was completed by 48 MOOC instructors worldwide. The findings revealed that MOOC instructors considered SDL skills teachable and creating learning environments to help develop SDL skills possible. In terms of their design and delivery practices to facilitate SDL via a MOOC, the findings suggest that the impact is mainly on learner self-monitoring and motivation. MOOC instructors motivated learners through high quality resources, helping set learning goals, course accessibility, short learning units, providing feedback, meaningful activities, and social learning opportunities. To help student self-monitoring, quizzes, feedback, and self-reflection were used. Strategies recommended to facilitate student management included providing flexibility and support, sending out reminder messages, and suggesting estimated timelines.

Keywords: massive open online courses, MOOCs, self-directed learning, instructional design

Previous research has indicated that self-directed learning (SDL) is integral to adult education (Garrison, 1997; Merriam, 2001). In addition, SDL is also considered critical in MOOCs (Bonk, Lee, Reeves, & Reynolds, 2015; Kop & Fournier, 2011; Terras & Ramsay, 2015). Some MOOC students have exhibited important learning traits such as being self-motivated in learning anywhere and anytime in the world (Jordan, 2014). However, a variety of studies have indicated that learners experience anxiety about SDL and would appreciate instruction and guidance related to SDL at the beginning of courses (Hewitt-Taylor, 2001; Lunyk-Child, Crooks, Ellis, Ofosu, & Rideout, 2001; Prociuk, 1990).

To address this issue, the instructor is expected to act as a facilitator to provide support to ensure that students develop the appropriate SDL skills (Kell & Deursen, 2002; Lunyk-Child et al., 2001). Unfortunately, few studies have examined instructional design challenges in creating a MOOC or the issues that emerge during

the actual delivery of that MOOC from the perspective of MOOC instructors (Margaryan, Bianco, & Littlejohn, 2015; Ross, Sinclair, Knox, Bayne, & Macleod, 2014; Watson et al., 2016); especially lacking is research on instructor perceptions related to facilitating SDL and how they design MOOCs to nurture students' SDL.

The purpose of this sequential mixed-methods study examined instructor perceptions and practices related to their facilitation of SDL in the design and delivery of MOOCs. The findings are intended to inform instructors or instructional designers of MOOC design practices that can facilitate students' SDL.

The following research questions guided this study:

1. How do MOOC instructors perceive students' SDL skills?
2. How do MOOC instructors perceive their facilitation of students' SDL skills?
3. How do instructors design and deliver MOOCs to facilitate students' SDL skills?

Theoretical Perspectives

Self-directed Learning

Since the work of Tough in 1971, concerns for SDL has significantly increased in the field of adult education (Merriam, Caffarella, & Baumgartner, 2007). One popular model is Garrison's (1997) three dimensions model, which defined SDL to include three overlapping aspects: (a) self-management (i.e., task control; focusing on external activities that influence the learning process such as the enactment of learning goals and the management of learning resources and support); (b) self-monitoring (i.e., cognitive responsibility that includes monitoring learning strategies and the ability to think about thinking; both internal processes and external feedback and support are vital); and (c) motivation (i.e., involves both entering and task motivation to initiate and maintain effort toward learning and realizing cognitive goals).

SDL in MOOCs

While the field of MOOCs and open education is relatively young and evolving, studies to date reveal that learners need to be self-motivated and self-directed in MOOCs (Kop & Fournier, 2011; Rohs & Ganz, 2015). Consequently, issues related to SDL have gained much interest in recent years (Bonk et al., 2015).

Key research topics in this field range from obtaining the general ideas for SDL from students' perspectives (Bonk et al., 2015; Loizzo, Ertmer, Watson, & Watson, 2017) to examining the relations between elements of SDL in MOOCs and other forms of open education (Beaven, Codreanu, & Creuzé, 2014; Kop & Fournier, 2011; Terras & Ramsay, 2015). For example, Terras and Ramsay examined MOOCs from a psychological perspective that mentioned some key points related to SDL. They indicated that individual differences in motivation and self-regulation are key learner attributes to consider in the context of learning from MOOCs. For example, Hew and Cheung (2014) revealed four main motivations of MOOC learners: (a)

acquisition of knowledge, (b) curiosity, (c) personal challenge, and (d) the acquisition of qualifications. In addition, Milligan, Margaryan, and Littlejohn (2013) and Beaven, Hauck, Comas-Quinn, Lewis, and de los Arcos (2014) demonstrated that self-regulation is crucial for learning in MOOCs. In particular, research indicated that goal setting and planning can significantly predict students' goal achievement such as earning a course certificate or finishing assessment (Kizilcec, Pérez-Sanagustín, & Maldonado, 2016).

Given that most MOOC learners are adults (Shah, 2017), it is important to note that many researchers have demonstrated that SDL is essential to adult education (Brockett & Hiemstra, 1991; Candy, 1991; Garrison, 1997; Merriam, 2001). In addition, studies have shown that taking personal responsibility, self-direction, and self-discipline are critical factors that impact a learner's success in online classes (Grow, 1991; Schrum & Hong, 2002). SDL is also considered an essential element in MOOCs (Bonk et al., 2015; Kop & Fournier, 2011; Terras & Ramsay, 2015). As the number of universities that are offering MOOCs is rapidly expanding (Shah, 2015, 2019) and most studies continue to focus on students' motivation and completion rates (Zhu, Sari, & Lee, 2018), scant research directly investigates the design of MOOCs to facilitate SDL from the instructor's perspective. In response, this study will examine instructor perceptions and practices related to their facilitation of SDL in the design of MOOCs.

Method

This study utilized a sequential mixed methods design (Creswell & Plano-Clark, 2017; Fraenkel & Wallen, 2009) consisting of two phases: qualitative followed by quantitative (Creswell & Plano-Clark, 2017). The primary data sources of this study included (a) in-depth interviews with four instructors who volunteered to participate; (b) detailed course review of the MOOCs taught or designed by the four interviewees; and (c) an online questionnaire sent in July 2018 to 492 MOOC instructors worldwide via SurveyMonkey with 48 valid responses. The researchers validated and cross-checked the findings using different data sources (Patton, 1990). This approach provided a more nuanced understanding of instructors' perceptions of designing and delivering MOOCs for SDL than relying solely on one data source (Baxter & Babbie, 2003).

Data Collection

Interview. To help design the questionnaire and obtain initial ideas about MOOC instructors' perceptions of SDL in MOOCs and their facilitation of SDL in MOOCs, an interview protocol with 12 questions was developed based on the prevailing research literature and expert feedback. The experts we consulted included one mixed-method expert, one design expert, and one MOOC research expert. For instance, they recommended to include questions about MOOC instructors' background such as their online or MOOC design experiences to better understand their instructional design and pedagogical approaches. The final 12

interview protocol items included questions on participant background information (four questions), their perceptions of students' SDL skills (three questions), their facilitation of SDL (four questions), and their professional development needs (one question). Semistructured interviews were conducted with four MOOC instructors via an online conference tool, Zoom.

The primary selection criteria for recruiting MOOC interviewees were (a) the instructors should have prior experience in designing and teaching a MOOC and (b) the instructors' MOOC should be delivered in English. The four interviewees represented four different subject areas and three different countries and MOOC providers. Selecting interviewees from diverse countries, subjects, and MOOC providers can potentially result in more comprehensive ideas. For example, the technology functions, features, and affordances of the platforms provided by different MOOC providers might influence instructors' instructional design and delivery decisions regarding SDL.

As indicated, diversity was sought when conducting the interviews. Two interview participants were from the United Kingdom (1 female, 1 male); one from the United States (female), and one from Canada (male; see Table 1). The interviewees taught different subjects: literacy, computer science, economics, and biology. The MOOC platforms of these four courses were Coursera (two MOOCs), FutureLearn, and Kadenze. The interviews were audio recorded. Each interview lasted approximately 30-50 minutes. The in-depth semistructured interviews enabled us to obtain MOOC instructors' perceptions of SDL in MOOCs and the strategies for facilitating SDL in MOOC design and delivery, which further informed the design of the questionnaire.

Table 1. *Interviewees' Demographic Information*

Country	Subject area	Platform	Gender
UK	Language and Literacy	FutureLearn	Male
UK	Computer Science	Kandenze	Female
US	Business	Coursera	Female
Canada	Geography	Coursera	Male

Document analysis. The documents were components of the MOOCs designed or taught by the interviewees. In order to triangulate the interview data, the primary researcher reviewed the four interviewees' MOOCs both before and after the interview.

Web-based questionnaire. The questionnaire was adapted from an instrument developed by Fisher and King (2010) and Williamson (2007) to measure student SDL based on the conceptual framework of Garrison (1997). In addition, we used the interview findings to revise the questionnaire items. For instance, based on the interview data analysis related to strategies that MOOC instructors used to facilitate SDL, we further revised the questions in the questionnaire such as help students with self-management skills (e.g., time management). The final questionnaire contained a total of 29 questions, including twenty 5-point Likert scale questions, three closed-ended questions about their perceptions of SDL in MOOCs, and six questions about demographic information of the participants. Self-management, self-monitoring, and motivation scales were composed of six, seven, and seven questions, respectively.

To test the internal reliability of the questionnaire, Cronbach's alpha was computed using SPSS. The Cronbach's alphas for the entire questionnaire as well as the self-management, self-monitoring, and motivation items were 0.79, 0.71, 0.76, and 0.65, respectively. The three closed-ended questions are multiple choice questions: (a) whether they considered students' SDL when designing or delivering MOOCs (yes or no questions); (b) their perceptions of SDL with three options (i.e., SDL is students' learning personal attributes that can never be changed, SDL is students' learning personal attributes that can be changed, and SDL is a set of skills that can be educated); and (c) their perceptions of facilitating students' SDL with three options (i.e., instructors can do nothing for students' SDL skills, instructors can unintentionally create a learning environment that encourages SDL skills, and instructors can intentionally create a learning environment to help develop SDL skills).

Data Analysis

Classical content analysis was employed to analyze interview data. Interview recordings were transcribed verbatim for coding immediately after the interview. The recordings were stored in Kaltura for mechanical transcription. Then, the primary researcher reviewed the transcriptions again to check the accuracy. To promote validity, first-level member checking was employed. As such, the transcripts were sent back to the interviewees for a member check to ensure the accuracy of the transcripts while also soliciting supplemental opinions.

After member checking, classical content analyses were conducted abductively by the primary researcher (Leech & Onwuegbuzie, 2007). In this study, the unit of analysis was the meaning unit. To perform an abductive content analysis, the researcher had a general SDL model and research questions in her mind. Next, she read through the entire set of data. Third, the researcher chunked the data into smaller meaningful parts. The fourth step, as recommended by Haney, Russell, Gulek, and Fierros (1998), required the researcher to label each chunk with a code and compare each new chunk of data with previous descriptions; any similar chunks were labeled with the same code. After all the data had been coded, the codes were grouped by similarity to identify themes. The main themes that emerged from the data are as follows: (a) perceptions of students' SDL, (b) perceptions of their facilitation of SDL, and (c) strategies to support

SDL in the design and delivery of MOOCs regarding motivation, self-monitoring, and self-management.

Descriptive statistics embedded in SurveyMonkey, SPSS, and Excel were used for questionnaire data analysis. The questionnaire used a 5-point Likert scale to measure instructor's perceptions of SDL in MOOCs.

The quantitative data analysis and qualitative findings from interview and MOOC reviews were integrated through joint display as detailed in the Findings session.

Contextual and Demographic Information of the Survey Participants

We sent the questionnaire to 492 MOOC instructors' email. Twenty-eight instructors opted out; 11 individuals completed the questionnaire partially; 185 did not open the survey; 220 declined the survey. As a result, 48 participants (10% response rate) fully completed the questionnaire. These who fully completed the questionnaire (n = 48) were from diverse subject backgrounds; i.e., language and literacy, business, medicine and health, and art. Their online instructional design experience varied. Instructors (n = 48) ranked on a scale of 1 (*Strongly disagree*) to 5 (*Strongly agree*) whether they had many experiences related to designing fully online or blended courses prior to designing their MOOCs. Among the 48 participants, 21 participants (44%) had no fully online or blended course design and teaching experience prior to designing a MOOC (see Figure 1). Only 29% of the survey participants (n = 14) had designed more than two fully online or blended courses. However, 25% of the participants (n = 12) had designed five or more fully online or blended courses prior to designing a MOOC. Clearly, there was a wide range of previous fully online or blended experience among the study participants.

In terms of specific MOOC design and teaching experience, 58% participants (n = 28) had designed or taught only one MOOC (see Figure 2). On the other hand, 10% of the survey participants (n = 5) had previously designed or taught five or more MOOCs. Overall, most MOOC instructors did not have extensive MOOC design experience.
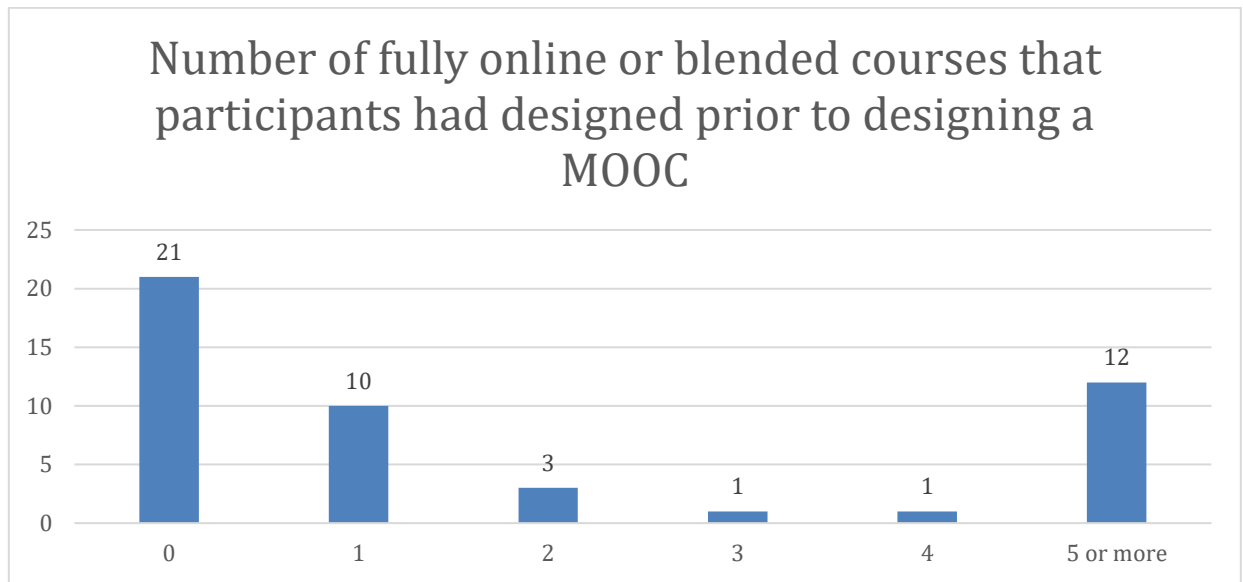
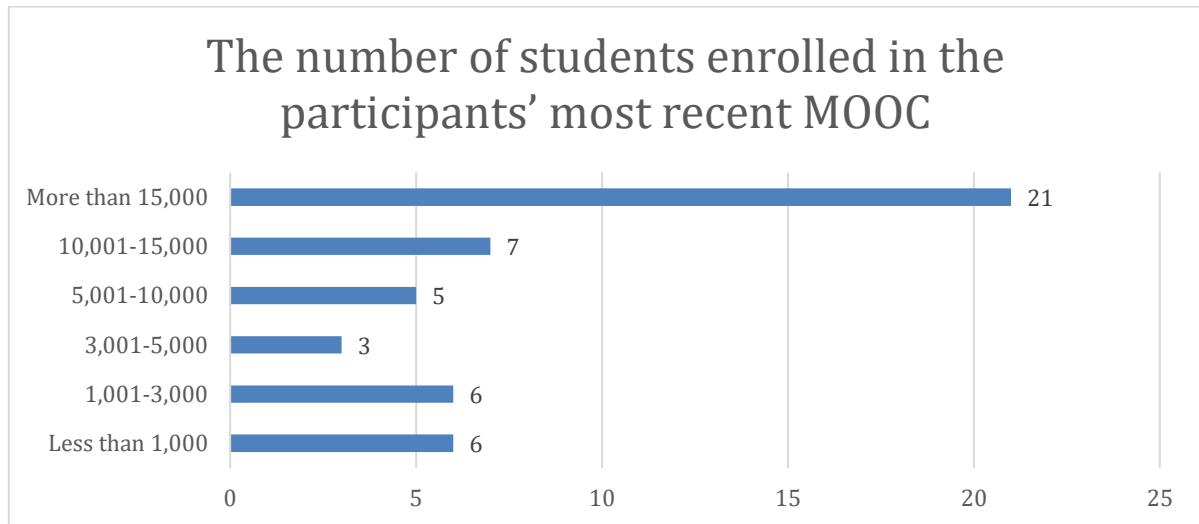*Figure 1*. Fully online or blended courses previously designed or taught by survey participants (*n* = 48).
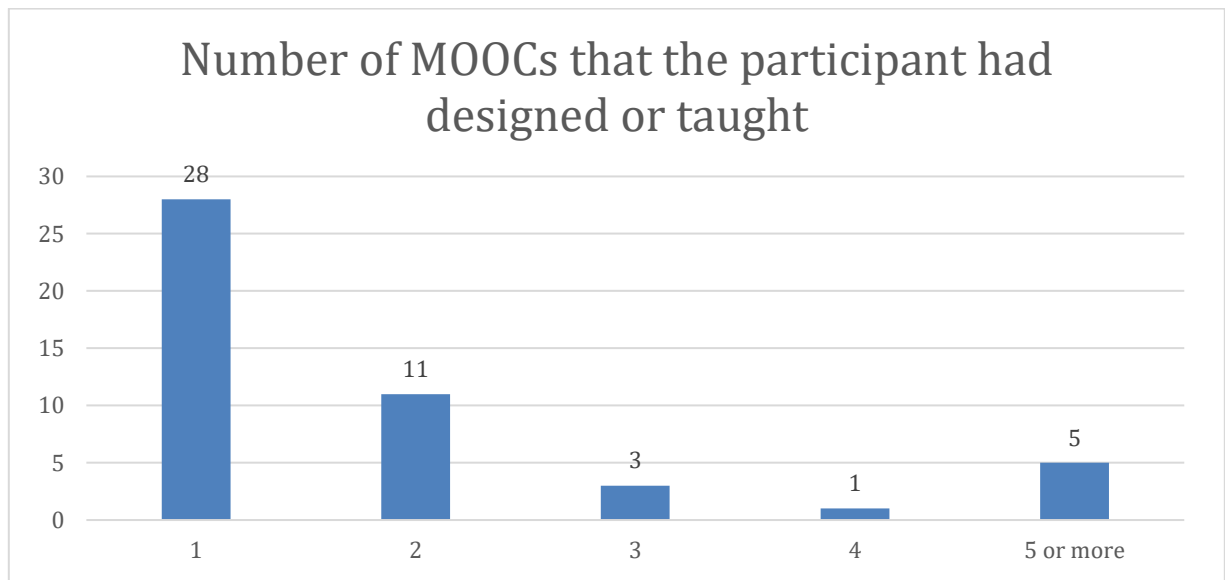
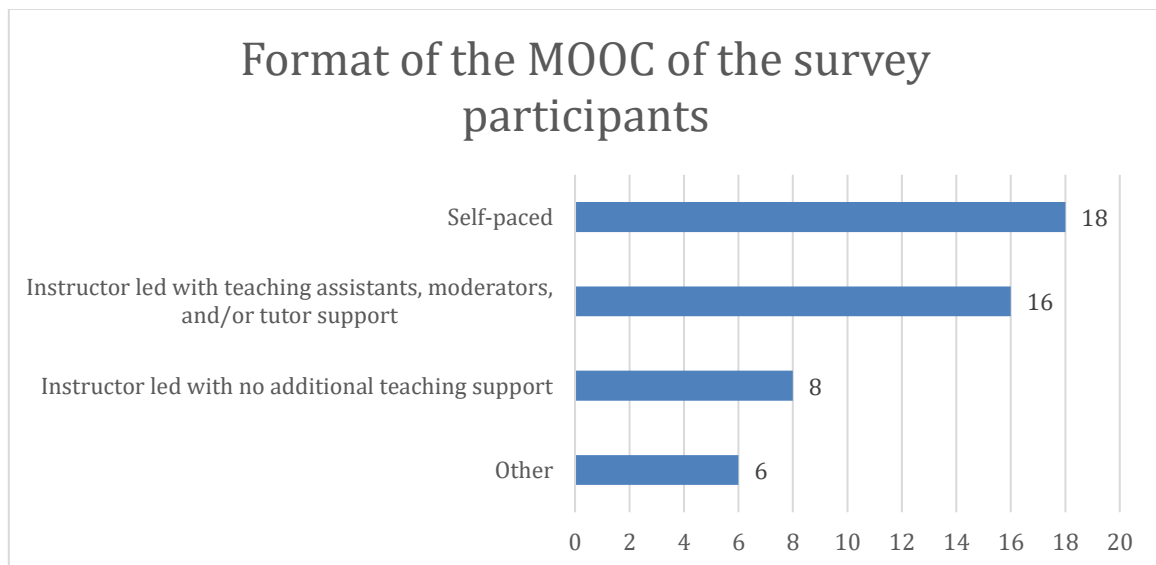*Figure 2*. The number of MOOCs that the survey participants had designed or taught (*n* = 48).

In general, the number of enrolled students in respondents' MOOCs widely varied (see Figure 3). For instance, 44% of respondent MOOCs (*n* = 21) had more than

15,000 students. Almost 60% of their MOOCs ($n = 28$) had more than 10,001 students. In addition, 6 out of 48 (13%) of respondents' MOOCs had less than 1,000 students.

In terms of the MOOC format, more than one-third of the MOOCs ($n = 18$) were self-paced, followed by instructor-led with teaching assistant support ($n = 16$), and instructors that had no such support ($n = 8$; see Figure 4).

The number of students enrolled in the participants' most recent MOOC

Category	Value
More than 15,000	21
10,001-15,000	7
5,001-10,000	5
3,001-5,000	3
1,001-3,000	6
Less than 1,000	6

Figure 3. The number of students enrolled in the survey participants' most recent MOOC ($n = 48$).

Format of the MOOC of the survey participants

Category	Value
Self-paced	18
Instructor led with teaching assistants, moderators, and/or tutor support	16
Instructor led with no additional teaching support	8
Other	6

Figure 4. The delivery format of most recent MOOC ($n = 48$).

Three out of four MOOC instructors noted that attempts at innovation in teaching and learning such as trying out new teaching strategies and increasing student access to higher education worldwide were key motivators for offering MOOCs (75%, $n = 36$). These answers were followed by building one's institutional reputation (63%, $n = 30$) and experiencing teaching and connecting to a large audience (60%, $n = 29$; see Figure 5). Only one participant was motivated by the possibility of obtaining a tenure track position.

Motivations for offering MOOCs

Category	Value
Innovation in teaching and learning	36
Increasing student access to higher education worldwide	36
Building institutional reputation	30
Experiencing teaching and connecting to a large…	29
Personal interest	23
Encouragement of the university	23
Building personal reputation	19
Conducting research on teaching and learning	15
Helping get tenure position	1

Figure 5. Motivations of survey participants for offering MOOCs ($n = 48$).

Findings

Research Question (RQ) 1. How do MOOC Instructors Perceive Participants' SDL Skills?

In response to the question "Have you ever taken students' self-directed learning into consideration when designing or delivering MOOCs?" seventy percent of the participants reported that they had. In addition, 52% of the participants ($n = 25$) reported that they perceived SDL as a set of skills that can be educated (see Figure 6). Forty percent of instructors ($n = 19$) considered SDL to be related to personal attributes of students that can be developed. However, none of the respondents believed that personal attributes related to SDL were unchangeable.
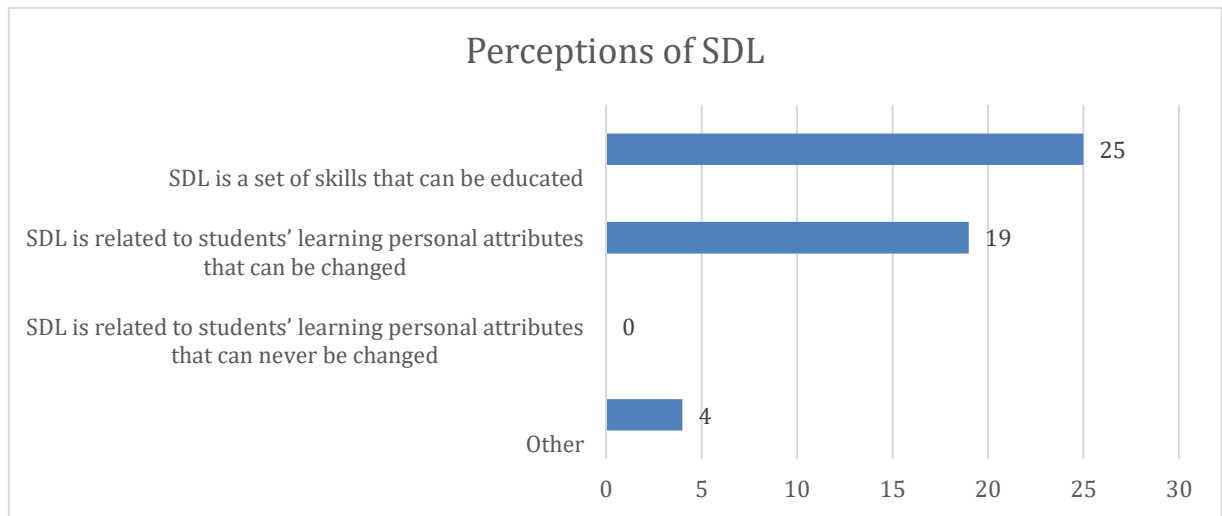
Perceptions of SDL

Figure 6. Survey participants' perceptions of SDL (*n* = 48).

From the interview, the MOOC instructors expressed their perceptions of participant SDL skills. For example, an instructor from the UK shared an example of students who had demonstrated high SDL.

> I guess to me it gets really exciting to look at how a number of those students have done projects that really go beyond the simple examples that I showed in lecture, and beyond the simple things they were asked to do in the assignments. You know they've taken them into the real world.… One student who during the presidential election made a presidential debate voiced motion classifier that you could run. And it would tell you whether candidates were being angry or not. It was just like really fun stuff that people did.

RQ 2. How do MOOC Instructors Perceive Their Facilitation of Participants' SDL Skills?

In general, MOOC instructors whom we surveyed reported that they could play a key role in facilitating participants' SDL skills. In fact, 92% of participants (*n* = 44) reported that instructors can intentionally create a learning environment to help develop SDL skills (see Figure 7). Six percent of the questionnaire participants (*n* = 3) reported that instructors can unintentionally create a learning environment that encourages SDL skills and 2% (*n* = 1) of participants selected other. No one believed that nothing could be done.
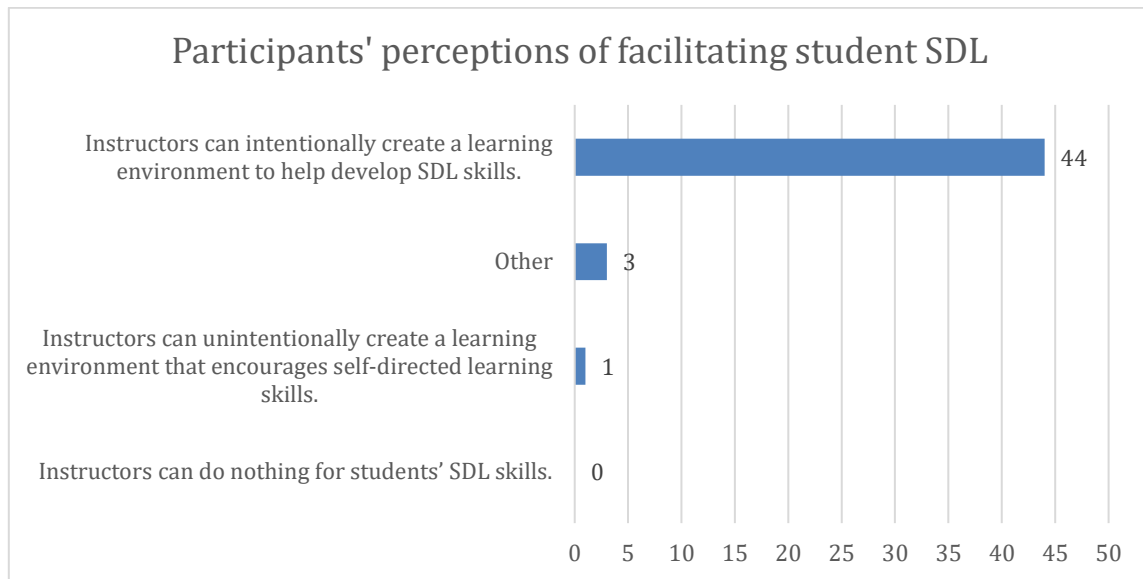
Participants' perceptions of facilitating student SDL

Instructors can intentionally create a learning environment to help develop SDL skills. — 44

Other — 3

Instructors can unintentionally create a learning environment that encourages self-directed learning skills. — 1

Instructors can do nothing for students' SDL skills. — 0

0 5 10 15 20 25 30 35 40 45 50

Figure 7. Survey participants' perceptions of their role in facilitating SDL skills
($n = 48$).

The questionnaire findings concurred with interview findings that MOOC instructors can facilitate SDL. When responding to questions about MOOC instructor responsibility of facilitating SDL, one instructor from the UK stated, "I mean instructors can absolutely help, and, furthermore, I think [it was] the architecture of the MOOC itself that really helped." Even though MOOC instructors considered that they had the responsibility of helping student SDL, they admitted that their effort was limited. One Canadian instructor shared this opinion:

> Yeah. I tried. But I also think it's probably their responsibility to be motivated. So, I just make myself available and encourage people to complete the course if they get stuck on something to ask questions or to move on.

RQ 3. How do Instructors Design and Deliver MOOCs to Facilitate Participant SDL Skills?

MOOC instructors responding to our questionnaire ($n = 48$) ranked on a scale of 1 (*Strongly disagree*) to 5 (*Strongly agree*) whether the design and delivery of their MOOC helps the students to develop SDL skills in detail. The mode of most of the items was 4 (agree), except the fourth item which had a mode of 3 (neither agree nor disagree). The top five SDL skills that their MOOCs facilitated included (a) motivates students to learn new information ($M = 4.37$); (b) helps the student critically evaluate new ideas ($M = 4.15$); (c) helps the student be in control of his/her learning ($M = 4.15$); (d) helps the student be responsible for his/her learning ($M = 4.06$); and (e) helps the student to be able to find out information related to learning content for him/herself (M

= 4.02; see Table 1). However, it seems that instructor MOOC designs have limited influence on students' management skills (e.g., managing time and learning resources; $M = 3.37$) and setting strict time frames for learning ($M = 3.21$).

Table 1. *Mean Score and Standard Deviation of the Specific SDL Skill that the Survey Participants' MOOC Facilitate*

Items	M	SD
1. helps the student be self-disciplined	3.71	0.82
2. helps the student be organized	3.71	0.74
3. helps the student set strict time frames for learning	3.21	1.03
4. helps the student have good management skills (e.g., managing time and learning resources)	3.37	0.79
5. helps the student prioritize his/her study (e.g., determine the order in which the studies are to be done)	3.60	0.82
6. helps the student be confident in his/her ability to search out information	3.85	0.68
7. motivates students to learn new information	4.37	0.64
8. helps the student develop a need to learn	3.90	0.69
9. helps the student embrace a learning challenge	4.00	0.65
10. helps the student critically evaluate new ideas	4.15	0.74
11. helps the student learn from his/her mistakes	3.79	0.77
12. helps the student to seek the deeper reasons of the facts	3.85	0.71
13. helps the student be willing to seek different ways to solve difficult problems	3.77	0.69
14. helps the student be in control of his/her learning	4.15	0.55
15. helps the student set his/her own learning goals	3.68	0.91
16. helps the student evaluate his/her own performance	3.94	0.78
17. helps the student be responsible for his/her learning	4.06	0.79
18. helps the student be able to focus on a problem	3.87	0.74
19. helps the student be able to find out information related to learning content for him/herself	4.02	0.70
20. helps the student have high beliefs in his/her abilities of learning	3.73	0.74

In the interview, the specific strategies MOOC instructors used in their design and delivery in terms of facilitating student SDL were revealed. The MOOC content, activity, and other open documents of these four instructors were reviewed to triangulate the interview data. As displayed in Table 2, 13 themes emerged in the interviews and content reviews.

Table 2. *Strategies to Facilitate MOOC Participants' SDL Skills*

Category	Subcategory	Strategies
Motivation	Course content accessibility	Our course is accessible and we make them think.
	High quality resources	We knew we had good resources, images, good film footage. We wanted something that is attractive.
	Instructor feedback	What I do is I just go on [the LMS] every day and try to answer questions and engage with people. The MOOCs we reviewed showed that instructors provided feedback in the discussion forum. [MOOC review]
	Learning goals	I think it is it is helpful in what we try to work through the course for if students can think to the future [goals]. That would be one of the self-directed skills that I think would help them. The MOOC instructors asked students to share their learning goals with classmates. [MOOC review]
	Meaningful learning	The topic is personal finance. And I think that is reasonably self-motivating in the sense that it is something that is very applicable to most people's lives.
	Short learning units	I think [a] common practice now, for instance, is to chop up video in a ten-minute chunk so that it's really easy for students to watch a little bit at a time, to watch it on the go…that can make it really easy for students

		to engage.
	Social learning community	We have people to create an image [or] a picture of their financial goals and then to put it out with hashtags on either like Twitter or Facebook or Instagram and share it with other people in the class.
Self-monitoring	Automated feedback system	It's my hope that the automated feedback system gives them enough useful information that they feel like they're getting something out of doing the assignments. The course provided automated feedback to learners once they answered the questions in quizzes. [MOOC review]
	Quizzes and other assessments	We had quite simple quizzes at the beginning and then [they] became slightly more difficult. Also with most of the materials, we try to deepen their thinking as time [goes] by. The course provided quizzes for self-assessment in each video. [MOOC review]
	Reflection	One of the things that I tried to do was give people opportunities for different types of engagement with explicit opportunities for reflection built-in.
Self-management	Flexibility and support	We've actually changed it a bit over time to try to find the right level of flexibility and support. The MOOC platform allowed learners to move to the new sessions with new timelines if they miss the previous timeline. [MOOC review]
	Reminding message	We have reading lists and I update the reading lists for the course on a regular basis. We have a mailing list we can use. I remind people to look at that and update it.
	Suggested timelines	There's sort of a suggested timeline for you. The MOOC platform provided suggested timeline on the first page. [MOOC review]

Motivation. To motivate students in courses, MOOC instructors relied on several strategies and tactics. For instance, they used high quality resources, helped students set learning goals, made their course accessible to learners, used short learning units, and provided different forms of feedback. They also made attempts to offer meaningful activities and social learning opportunities that might better engage their MOOC participants. For example, as noted in the quote below, one instructor from the US engaged her students by providing a social learning community:

> We did try to really think about how we could get people involved. We really tried to build that discussion questions so that for everyone if you're taking the course and really trying to get credit for it like, the certificate, then you have to reply to other people's forum in order to keep progressing through the course. You can't just post your own. So, we're really trying to encourage people to engage with each other during the course. Thinking that building community might help people stay engaged.

A professor from the UK highlighted how he facilitated SDL skills by engaging students and making them accessible. As he described,

> We knew we had good resources, images, and good film footage…We worked really hard to make the point of entry as wide as possible. And it has shown from the enrollment of 17,000 people. So our course is accessible and we make them think.

Another professor from the UK made the learning meaningful to motivate student learning. She observed that "for student motivation it was really important to me to make it very clear how all the concepts we were talking about could be applied in projects that they cared about." In effect, she was attempting to connect the content of her MOOC to a wide gamut of personal experiences, backgrounds, and expectations.

Self-monitoring. As might be expected, there are myriad approaches for fostering SDL skills. To help student self-monitoring, these MOOC instructors tended to rely on quizzes as well as different forms of feedback and self-reflection. For instance, an interview with one instructor from Canada revealed a more behaviorally-based tactic that some MOOC instructors use to facilitate student SDL skills. He argued, "I think our quizzes at the end are helpful… We have reading lists and I update the reading lists for the course on a regular basis." He added that they "direct people to that" and send reminders through the forum and emails.

Self-management. Last but not least, MOOC instructors facilitated student management by providing flexibility and support, sending out reminding messages, and suggesting estimated timelines. For instance, one professor from the UK stated,

> And there's, sort of, a suggested timeline for you. If you don't submit something by a deadline, you're not going to be analyzed. You know you just could submit

it all [on] the last day all at once and still get the same feedback and get the same grade. But also, the grade doesn't actually mean anything, because…it's not for credit.

Limitations of the Study

There are several notable limitations of this study. First, the instructor names, institutions, contact information, and courses were collected from several key MOOC vendor websites including Coursera, FutureLearn, and edX, while skipping those not in English like XuetangX. In addition, respondents' completion rate, while acceptable for an opt-in questionnaire (Cho & LaRose, 1999), was just 10%. Third, the four MOOC interviewees in this study were the ones who self-reported a strong affinity towards SDL. Given that the questionnaire and interview data were self-reported, the data collected relied on the MOOC instructors' truthfulness in responding to the questions. Finally, we could not verify whether the strategies that MOOC instructors reported were effective or not.

Discussion and Significance of this Study

This study explored instructors' perceptions of SDL and the design of MOOCs to facilitate learners' SDL. The goal was to inform instructors as well as instructional designers of the effective practices for designing MOOCs to facilitate students' SDL. In confirming Garrison's (1997) SDL model, the findings of this study indicated that MOOC instructors considered that SDL was related to motivation, self-monitoring, and self-management. Notably, MOOC instructors acknowledged the importance of SDL skills in MOOC learning.

      Among the diverse SDL skills and competencies, MOOC instructors emphasized student motivation most. They reported that students should have a basic level of SDL skills or attributes whether they were operating in a MOOC or some other type of educational environment. However, a majority of the MOOC instructors reported that these skills or attributes were not static. In effect, study participants most often viewed SDL as a set of skills that could be educated or students' personal attributes that could be changed. Stated another way, they were optimistic about learners' ability to acquire or enhance their SDL skills and repertoire.

      The findings of this study support the findings from previous studies which found that SDL is an essential and important element for students in MOOCs (Bonk et al., 2015; Kop & Fournier, 2011; Terras & Ramsay, 2015). In addition, self-motivation is one of the most important attributes or skills in MOOCs reported by MOOC instructors, which supports the findings from Kop and Fournier and Rohs and Ganz (2015). This study found that MOOC instructors consider SDL as basic attributes and skills needed to succeed in a massively open online course or any course for that matter; such findings align well with many adult education scholars' perspectives of SDL (Brockett & Hiemstra, 1991; Brookfield, 2013; Candy, 1991; Garrison, 1997; Merriam, 2001).

In accordance with Guglielmino's (1977) suggestion that SDL awareness and practice is vital to their enhancement, the present study found that a majority of MOOC instructors feel that SDL skills or attributes can be enhanced or educated. These findings also support what Kell and Deursen (2002) suggested that most MOOC instructors feel that they can intentionally create learning environments that foster the development of SDL skills. Clearly, such a view supports the idea that instructors can effectively support students to develop SDL skills (Kell & Deursen, 2002; Lunyk-Child et al., 2001).

In terms of their design and delivery practices to facilitate SDL via the MOOC, it seems that the impact is mainly on learner self-monitoring and motivation. Such findings are aligned with the findings of Barba, Kennedy, and Ainley's (2016) study that showed a positive relationship between learner motivation, participation, and performance in MOOCs. Along these same lines, Howe (1987) argued that motivation influences cognitive aspects of learning. Of course, feedback is a vital component in positively influencing student performance (Collis & Margaryan, 2005). It is incumbent, therefore, for MOOC instructors and the entire instructional design team to find ways to lend feedback to MOOC participants whether it is from other humans, the course management system, or other embedded technology tools and applications. Nevertheless, as Watson et al. (2016) noted, since it is impossible for instructors to provide direct or immediate feedback on thousands of submitted assignments, MOOC learners are often demotivated. In this study, MOOC instructors revealed that instructor feedback and automated feedback are crucial for motivating students and fostering student self-monitoring.

To foster students' self-monitoring, MOOC instructors in the present study provided quizzes for self-assessment and reflection opportunities. MOOC instructors reported that self-assessment gave their participants a chance to review their work and monitor their learning process. Such findings align with the findings of Kulkarni et al. (2013). Other scholars have claimed that self-assessment helps students reflect on their learning and achievement (Pintrich & Zusho, 2002; Zimmerman & Schunk, 2001) and offers students a learning opportunity that they cannot easily obtain from external feedback (Dow, Kulkarni, Klemmer, & Hartmann, 2012).

For facilitating self-management, particularly time management, MOOC instructors in this study reported that they provided estimated time frames. Time management refers to students scheduling and managing their study time (Alario-Hoyos, Estévez-Ayres, Pérez-Sanagustín, Kloos, & Fernández-Panadero, 2017). Unfortunately, students who have low time management skills tend to have higher possibilities for dropping out from MOOCs (Nawrot & Doucet 2014; Zheng, Rosson, Shih, & Carroll, 2015). On the other hand, studies have indicated that students who complete a MOOC demonstrate high time management skills, which further verifies that time management is one of the most effective SDL skills (Kizilcec et al., 2016).

Conclusions

As evident, this research begins to fill a critical gap in the MOOC literature by exploring instructor perceptions and practices related to student SDL. It did this through

triangulating MOOC instructor questionnaire data with interviews of four MOOC instructors and content analyses of their courses for evidence of SDL approaches and strategies. Better understanding of MOOC-related SDL skills and competencies as well as associated instructional components and approaches to encourage MOOC learner SDL should result in higher completion rates. It conceivably could also result in greater governmental or institutional reliance on MOOCs as a viable educational delivery platform and, therefore, be a key part of a country's strategic planning and overall economic engine.

We are currently in the midst of expanding the present research study with additional MOOC instructor participants in the hope that it will further inform the design of more effective and engaging MOOCs. We are also currently interviewing MOOC learners about their SDL needs and experiences. When combined, insights from MOOC instructors and MOOC learning participants should foster an understanding of SDL processes and instructional possibilities that can lead more learners to success not just with respect to MOOCs but with every learning setting in which they might participate be it physical, digital, or some novel mixed approach.

In the end, this study offers several important and evolving insights into MOOC design for SDL. The findings provide implications for instructors as well as instructional designers concerning the design of MOOCs for self-directed learners. The online questionnaires, interviews, and document reviews were just the first steps in the process. It is now incumbent on additional MOOC researchers to join our efforts in determining how, when, and in what specific ways to foster SDL in MOOCs. The world community is waiting.

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International Journal
of
Self-Directed Learning®

Cover design by Gabrielle Consulting

International Journal of Self-Directed Learning

Volume 16, Number 2, Fall 2019

Preface

This issue reveals the continued global interest in self-directed learning as a field of inquiry.

In the first article, Hashad presents the findings of an exploratory mixed method design used to examine the self-directed learning of young college graduates in Egypt. Specifically, motivation and the role of information and communication technologies tools that support personal learning were investigated. The quantitative phase ($n = 135$) and the subsequent qualitative phase ($n = 12$) reveal the important role of these tools in facilitating self-directed learning.

Next, Katz and Westera investigated the difference in performance of Dutch students ($n = 150$; age range: 12-15 years) in a physical education lesson when subjected to varying levels of autonomy in learning. Findings suggest performance to be positively influenced by autonomy with a greater benefit realized by higher performers.

In the final article, Zhu and Bonk present the findings of another sequential mixed method design used to examine the perceptions of self-directed learning among massive open online course instructors. The qualitative phase ($n = 4$) and the subsequent quantitative phase ($n = 48$) indicate that the instructors believed self-directed learning skills to be teachable via instructional design. Strategies to promote self-directed learning are addressed.

All of these articles support the important, productive role that educational professionals play in providing facilitative tools and instruction that promote self-directed learning. I thank the authors for sharing their findings and insights with our readership.

Michael K. Ponton, Editor

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