

RESEARCH ARTICLE

The effect of content-related and external factors on student retention in LMOOCs

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Abstract

Commonly, low completion rates in massive open online courses have called into question the quality of their learning materials and instruction. This paper attempts to identify crucial factors of engagement and retention in language massive open online courses (LMOOCs) in the context of the open online program of Icelandic Online, a self-guided course for second language learners of Icelandic. The study seeks to explore the impact of factors associated with the course's instructional design on engagement and retention and reveal crucial determinants of attrition. The study depends on survey and tracking data from 400 learners and qualitative data from 62 informants in one course. It builds on previous studies on student engagement and retention in LMOOCs (Friðriksdóttir, 2018, 2019). The present study identified six content-specific factors that the majority of participants considered to be important for their motivation. Some factors, such as gradual and scaffolded presentation of input, had a positive impact on retention. Furthermore, statements from learners in the study who disengaged before completing show that non-course-related factors, such as time constraints, affect LMOOC retention. The study provides a new framework for how to promote student engagement and suggests specific strategies for other LMOOC developers.

Keywords: LMOOC retention; learning analytics; content-specific factors; reason for non-completion; Icelandic Online

1. Introduction

The typically low retention rates in massive open online courses (MOOCs) have called into question the quality of learning materials, instruction, and methodological strategies for transmission (de Freitas, Morgan & Gibson, 2015; de Larreta-Azelain, 2014; El Said, 2017; Sokolik, 2014) and have triggered wide-ranging studies aimed at discovering key factors for student engagement and retention. Researchers stress the need for new and engaging forms of pedagogy and design strategies to promote an engaging experience in such courses (Colpaert, 2014; Hew, 2016; Hone & El Said, 2016; Sokolik, 2014). More knowledge, however, is needed on student experiences in language massive open online courses (LMOOCs) and the effectiveness of specific course-related factors on engagement and retention (de Larreta-Azelain, 2014; Martín-Monje, Castrillo & Mañana-Rodríguez, 2018). Greater understanding is also needed around other reasons why learners who intend to complete a course disengage before completing (El Said, 2017; Reich, 2014).

This paper comes from a survey-based study with 400 learners that enlisted their views on their experiences of content-specific factors in one of the courses in Icelandic Online (IOL) (<https://www.icelandiconline.com>), known as IOL 2, and the influence of these factors on motivation and retention. The paper also investigates learners' reflections, elicited through the survey, on the reason why learners (62 informants) who had the initial goal of completing the course

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disengaged before completing. IOL is a computer-assisted language learning (CALL) program that was constructed at the University of Iceland (UI) specifically for second language (L2) learners of Icelandic. IOL 2 is a self-directed, open, and free online course for adults at the lower-intermediate level. It is also offered in tutored, blended, and distance modes. IOL's framework, pedagogy, and technical implementation aims to create an effective learning environment that cultivates language learning and supports and engages autonomous learners (Arnbjörnsdóttir, 2004, 2007). The program has an integrated tracking system to monitor students' retention from the time they enter a course until they leave. Around 240,000 people worldwide have enrolled in IOL.

The present study is grounded on two previous parts of a larger research project (Friðriksdóttir, 2018, 2019). The overall aim was to discover significant factors of engagement and retention in LMOOCs by exploring the topic in the context of the IOL program. The first phase of the study was based on an analysis of tracked retention data. The findings on overall retention and learners' progression throughout the IOL courses and three different delivery modes demonstrated completion rates ranging from 2.5% to 18% (Friðriksdóttir, 2018). Moreover, that study illuminated patterns of engagement throughout the program and attrition patterns among non-completers, a sharp initial dropout, and large attrition peaks late in the courses. These called for re-evaluation of the previous frameworks that measure students' attendance in MOOCs: instead of defining course completion as 100% coverage of a course's content in the subsequent studies, completion was defined as 80% to 100% of a course's content (Friðriksdóttir, 2019).

The second phase of the research, based on survey and tracking data, focused on students in the tutored modes of IOL 2 who received tutor support and personal guidance, and their views on the influence of several tutor-specific and other motivating factors for retention in IOL 2. Friðriksdóttir (2019) found that the majority of these students considered tutor support to be essential to their engagement with the course. These factors seemed to influence retention in the blended but not in the distance modality. That study also explored learners' initial intentions for course engagement and the effect of the initial goal factor on retention, showing that most learners intended to complete it and that this factor influenced retention. Moreover, based on students' reflections on why they completed IOL 2, the same study showed that some learners were driven toward course completion by factors such as appealing content, whereas others seemed to be mainly stimulated by the credits offered in this mode.

As a follow-up to the two studies previously described, the aim of the current paper is to consider whether specific factors associated with IOL 2's content and instructional methodology, such as the structure and organization of the curriculum, affected the learners' motivation and retention, and to explore what external factors may explain why learners leave such courses. The following section contextualizes the research by reviewing previous studies in the field.

2. Learning analytics applied to LMOOCs: engagement, motivation, and retention

The low completion rates of MOOCs (Jordan, 2015) have triggered a number of investigations into various aspects that may affect student engagement and retention. Scholars have emphasized that retention in MOOCs should be explored in relation to factors such as learning material, instructional design, and pedagogical practices, and also individual reasons that may impact student engagement (Henderikx, Kreijns & Kalz, 2018; Hew, 2016; Hone & El Said, 2016; Koller, Ng & Chen, 2013; Shapiro *et al.*, 2017). The use of learning analytics provides a valuable means to examine learner-produced data at the time of their engagement with a course and enables a better understanding of the effectiveness of course materials (Martín-Monje *et al.*, 2018; Thomas & Gelan, 2018). This is the focus of this study. The data from 400 learners in IOL 2 were collected by tracking users' tangible engagement with the course content. The same learners then reported on their experiences in a survey on the effects of content-specific and individual factors on why they did not complete the course.

LMOOCs, many of which are still in their early stages of development (Bárcena & Martín-Monje, 2014; Colpaert, 2014; Sokolik, 2014), have been described as “dedicated Web-based online courses for second languages with unrestricted access and potentially unlimited participation” (Bárcena & Martín-Monje, 2014: 1). Concerns have arisen about whether language learners are provided with engaging forms of design and pedagogy to facilitate the process of language learning in such environments (Colpaert, 2014; de Larreta-Azelain, 2014; Sokolik, 2014). Colpaert (2014) argues that the design of (L)MOOCs mainly reflects the design of the tool applied, “assuming some globally applicable learning and teaching model” (p. 167), and criticizes a lack of adaptation to the relevant subject matter and a specific targeted user group with different needs. These are issues that could explain the high dropout rates in such courses.

In this vein, de Larreta-Azelain (2014) and Sokolik (2014) stress that LMOOCs require a platform that is specifically aimed at the complex undertaking of teaching and learning a language. De Larreta-Azelain (2014) emphasizes the significance of creating a structure where technology and pedagogy go hand in hand, considering different learning styles, and is based on the Common European Framework of Reference for Languages (CEFR) (Council of Europe, 2018). The value of CALL for the language learner has been pointed out in this context, as it has the potential of an effective intertwining of technology and pedagogy (Chun, 2012, 2016; Colpaert, 2014). CALL researchers call for more evidence on how technologically enhanced devices and activities may support the language learning process and for more knowledge based on research on CALL’s theories, methods, and models (Chun, 2012, 2016; Colpaert, 2018). More evidence on learners’ perspectives in LMOOCs is also needed and whether course design factors and pedagogy influence retention (Bárcena & Martín-Monje, 2014; El Said, 2017; Hew, 2016; Hone & El Said, 2016).

Factors related to MOOC course design have been identified as critical factors for retention (El Said, 2017; Hone & El Said, 2016) and diverse course elements and strategies have been proposed as significant engagement features. Hubbard (2013) highlights the need for content curation for autonomous learners in open access learning where materials are selected and organized relevant to a topic and the appropriate language level. Dörnyei, Muir and Ibrahim (2014) call for well-organized and structured course content for learners consisting of organized objectives and expectations that are clearly presented so that learners may understand what is expected and thus promote engagement (El Said, 2017). De Freitas *et al.* (2015), Doiz, Lasagabaster and Sierra (2014), Hew (2016), and Teixeira and Mota (2014) point out the need for a more scaffolded approach and more structured support to increase retention. Furthermore, evidence suggests that appealing learning materials, including multimedia presentation of materials, serve as important stimuli for learners (El Said, 2017; Friðriksdóttir, 2019; Hew, 2016). It has thus been highlighted that situational interest in a topic may be a strong motivational factor in MOOCs and that course activities and content are key elements to trigger and maintain students’ attention (de Barba, Kennedy & Ainley, 2016; Friðriksdóttir, 2019; Hone & El Said, 2016).

Although motivating content is important for retention, individual factors also play a role. Students participate in MOOCs with multiple motives and goals that also need to be considered in the discussion on retention (de Barba *et al.*, 2016; Friðriksdóttir, 2019; Sokolik, 2014). Evidence shows that many learners join a MOOC with the intention to complete it. However, many of those fail to do so (Friðriksdóttir, 2019; Reich, 2014). Previous research has identified disengaging features of MOOCs that relate to issues with course design, low course interactivity, lack of support, and outside elements such as time constraints (de Freitas *et al.*, 2015; El Said, 2017; Henderikx *et al.*, 2018; Shapiro *et al.*, 2017). Greater understanding, however, is needed about why committed learners disengage before completion (El Said, 2017; Reich, 2014).

While course content has been found to be a critical factor in MOOC retention (El Said, 2017; Hone & El Said, 2016), and specific LMOOC features have been proposed as important factors in engaging learners (Bárcena & Martín-Monje, 2014; de Larreta-Azelain, 2014; Sokolik, 2014; Teixeira & Mota, 2014), this study provides empirical evidence not only of learners’ experiences

with content-specific factors and pedagogical practices in IOL 2 but also of the influence of these factors on actual retention. Additionally, this study addresses another gap in the literature, namely the lack of previous research examining committed learners' views about why they disengage before completing (El Said, 2017; Reich, 2014). It thus attempts to reveal learners' views on why they did not complete IOL 2 as they intended. The next section introduces the study's research context.

3. Context of the study

The IOL program is provided in an independent design platform and contains features specifically designed for language learning and teaching of highly inflected languages such as Icelandic. The courses are asynchronous, fully online, and interactive, as well as curated and sequential. The seven IOL courses are skill based (A1–C1) and linked to the CEFR levels, and allow for open and free access and enrollment. They include support materials such as electronic dictionaries and a database of Icelandic inflections. The courses are defined here as language MOOCs. The development of the program began at UI in 2001. The first courses, IOL 1 and IOL 2, were launched in 2004 and 2005 and the latest in 2013.¹ IOL's tracking system was implemented in 2006. The courseware was designed in collaboration with second language acquisition (SLA) experts, Icelandic linguists, and experienced teachers of Icelandic as an L2, designers, and software engineers who were also experts in language technology and linguistics. IOL is an SLA theory-based CALL program and comprises specific engagement strategies intended to support learners in the learning process. The theoretical foundations and instructional methodology of the program as well as the content-specific factors that are the focus of the study are outlined as follows.

The instructional approach in IOL mirrors the intention to facilitate a gradual promotion of language learning through appealing course content with an effort to engage learners and keep them enrolled. The theoretical criteria that guided the development of the course content included scaffolding of the structure (Arnbjörnsdóttir, 2004; Bruner, 1974; Lantolf, 2000) and organization of the content (Aebersold & Field, 1997; Arnbjörnsdóttir, 2008) in order to gradually build proficiency with sequential and gradual presentation of input and scaffolded and visual presentation of grammar (Arnbjörnsdóttir, 2004). Efforts to implement solutions to the presentation of inflectional morphology in a meaningful context are based on Chapelle's (1998, 2003) model of "relevant SLA hypothesis" and Schmidt's (1992) ideas of attention and noticing (Arnbjörnsdóttir, 2004). As Icelandic has a complex morphological structure, an effort is made at lower levels in IOL to facilitate L2 learners' comprehension of the variety of ways in which a nominal can change forms and to support learners in constructing and negotiating meaning.² These include input enhancement through focus on form (Doughty & Williams, 1998) where the focus is on grammar in the input and each of the different foci is assigned a different color (Arnbjörnsdóttir, 2004). A bi-leveled presentation of the grammatical information in IOL is scaffolded to provide learners with gradual and sequential support, taking into account that not all learners may be grammatically inclined, and to avoid overwhelming the lower-level learner with information that may not be useful for some (Arnbjörnsdóttir, 2004). Chapelle's (1998, 2003) idea of choosing relevant SLA theories in reconciling CALL and the multitude of different approaches to SLA theory and pedagogy mirrors the working criteria adopted by the developers of IOL (Arnbjörnsdóttir, 2004). Each of these approaches guided the development of IOL with the

¹Since then, IOL has been upgraded and is now available in a new mobile-compatible system.

²For instance, the learner may encounter 15 forms of the noun *dagur* (day) depending on grammatical case, number, and definiteness: *dagur*, *dag*, *degi*, *dags*, *dagar*, *daga*, *dögum*, *dagurinn*, *daginn*, *deginum*, *dagsins*, *dagarnir*, *dagana*, *dögunum*, *daganna*. A beginning learner cannot easily continue in a communicative language course without an explanation of all the different forms.

intention of facilitating and promoting language learning and engagement. This study focuses on six content factors in IOL 2, presented as follows, and investigates their potential effect on student engagement and retention. These factors refer to design elements concerning structure and organization of the course and pedagogical principles.

Curated and sequenced course structure and clear and salient learning objectives. Consistent with IOL's pedagogical approach of guiding the learners through a sequenced and structured learning path, the course material is organized and segmented into five thematic sections each with three lessons or parts (discussed as follows). Learners are initially introduced to explicit section-specific learning objectives regarding vocabulary, grammar, or language usage in each section.

Gradual and scaffolded presentation of input. Based on the sequenced course structure and organization of the course material, the topic is introduced in three steps throughout each section in an attempt to present the input gradually and provide scaffolding of information.³ Part I introduces what the learner is going to focus on and comprises visual input that includes vocabulary, grammar, and language usage. Part II contains texts, written and oral, where the vocabulary and grammar introduced in Part I are presented in context, followed by comprehension exercises. Part III focuses on output and provides opportunities for learners to practice what they have focused on in the two previous parts.

Continuing storylines. As a context for language input and practice, activities in the course center around storylines. They are supported by illustrations that are meant to appeal to a wide range of interests to provide a stimulating and engaging content. Each section focuses on a specific story, which is based on authentic texts or conversations that are adapted to learners' levels and the learning objectives. For example, they follow a protagonist, an exchange student at UI, throughout a section as he goes about his academic and social life.

Form-focused and scaffolded presentation of grammar. In an effort to draw the learners' attention to the target grammar in a meaningful context and to explain linguistic features, the forms are highlighted in the text and grammatical information is delivered in a scaffolded presentation. First, to point out the grammar in focus, the learners are provided with the option of moving their mouse cursor over the text, which then displays the grammar items highlighted in the text with different colors depending on the input. Then, a one-liner (referred to as "grammar help" in the survey), which explains briefly the core of the particular grammar item, appears underneath. Finally, if the learners want to know more about this grammar, they can go deeper into the grammar by clicking on the one-liner, which directs them to a larger grammar resource ("read more" in the survey).

Variety in types of learning objects. Learning objects were specifically pre-programmed to serve IOL's pedagogical approach of providing learners with varied and engaging learning material and learning opportunities, resulting in a wide range of learning objects throughout the course that are derived from approximately 40 different software design patterns. This involves different types of media and includes short videos as a source of authentic language material, soundtracks, visual and interactive exercises that introduce grammar and vocabulary, and various tasks for language usage. Thus the course as a whole was carefully planned beforehand to present different and interchanging characteristics of learning objects to account for different learning styles. Additionally, certain types of learning objects were deliberately chosen to approach different inputs and to serve the target language from a linguistic point of view. For example, animation was considered well suited to demonstrate how and why declensional endings change in Icelandic. Audio files and automated feedback are provided for nearly every exercise in the course.

³In the development phase of IOL, the instructional design of the content and structure, and exercises, were thoroughly planned and laid out for this purpose.

4. The study

This study is based on tracking and survey data from students ($n = 400$) in IOL 2 in order to examine the effect of content and external factors on retention. Two research questions were addressed:

1. Do learners in IOL 2 consider the following factors pertaining to the structure and organization of the course and the design and pedagogical principles important for their motivation to carry on in the course? If so, are they more likely to complete than those who consider them unimportant?
 - (a) Curated and sequenced course structure
 - (b) Clear and salient learning objectives
 - (c) Gradual and scaffolded presentation of input
 - (d) Continuing storylines
 - (e) Form-focused and scaffolded presentation of grammar
 - (f) Variety in types of learning objects
2. Why do learners who intend to complete IOL 2 not complete it? What is their primary reason for leaving?

4.1 Participants

Participants in this study were learners ($n = 2,605$) in IOL 2 from 2010 to 2018. A total of 400 (15.4%) learners completed the survey. The study population is diverse, with 63% originating from 12 countries: Germany, the United States, the Philippines, the United Kingdom, France, Canada, Poland, Denmark, Sweden, Russia, Italy, and Switzerland. Of those who responded, 60% were female and 40% were male. The ages ranged from 16 to 87, with a mean age of 39. Moreover, 74% have a university degree.

4.2 Data collection

Data were collected from learners through IOL's tracking system that gathered information on retention; a questionnaire that incorporated students' views about IOLs 2's content, their initial intentions in terms of course engagement, and reports on non-completion of the course; and an open-ended section in the survey that elicited students' responses on why they disengaged from the course. The data that were used are described as follows.

4.2.1 Tracking data

Data were collected from the tracker that assembles data on the users ($n = 400$) based on the learner's username and records the first time a user logs in, the location of the user as she or he progresses, and when the user signs out of the course. The tracker captures a learner's access logs when they click on each content page of the course. Content pages are the organization of the course's content, not an actual page online. IOL 2 contains 63 pages, each with several learning objects. When tracking retention, a learner who reaches content page 10 is marked as finishing 15.9% of the course content. When the learner is on content pages 51–63, she or he has covered 80% to 100% of the curriculum. Course completion applies when learners have completed from 80% to 100% of course content. Those who covered 15.9% to 79.4% are considered non-completers of the course (Friðriksdóttir, 2019). The tracking data on student activity are then stored in a database.

4.2.2 Survey data

Survey data from learners who completed a post-course survey via email in April and May 2018 and who had covered more than 15% of the course content as measured by the tracker were used

to analyze learner perspectives on the course. Survey participants ($n = 400$) were recognized by their ID numbers in the IOL database. The survey was extensive and was designed to collect data for the prior and present study, and for future investigations. The survey was primarily constructed around IOL's specific design factors. It was also constructed in light of previous findings on the engagement patterns identified in IOL 2 (Friðriksdóttir, 2018) and of a review of past literature. Additionally, it was based on informal evidence (Colpaert, 2010) gathered from learners' testimonies collected via email or face-to-face and pilot interviews (Friðriksdóttir, 2015). Informal suggestions from the IOL alpha and beta tests done during content and software development were also used. The anonymous survey, completed in English, included figures from IOL 2 to ensure that participants would relate to the context of the questions. To assess students' experiences of the significance of the content-specific factors, participants were asked to value how important each factor was for their motivation to continue with the course using a 5-point Likert scale. To evaluate students' initial intentions with regard to course engagement, they were requested to explain their initial intent to complete the course, work partially on it, or if they had no such goal. To gather self-reports on their progress, they were asked to declare whether or not they had completed the course.

4.2.3 Qualitative data

To elicit qualitative data about the reasons why students who had the stated intention of finishing the course did not do so, these participants (62 informants) were encouraged to give their perspectives in the survey's open-ended question form (Creswell, 2013; Doiz *et al.*, 2014) by using the fill-in sentence (Colpaert, 2010) of "If it turned out that you did not complete the course after all, please write three keywords to describe why you think your goal changed."

4.3 Data analysis

Data for analysis were selected based on the two research questions previously stated.

4.3.1 Survey data in relation to tracking data

To address the first question on learners' experiences of the content-specific factors and possible effect on retention, tracking data were found by first recognizing students in the course, followed by measuring where each user was last positioned in the course. From this experimental data, a sample group was created comprising those who had covered from 15.9% to 100% of the course material. The data from this sample group were then uploaded into the web survey tool Qualtrics. The survey data used for analysis were found by identifying individual respondents relating to each of the content-specific factors in the course. The survey data were then exported into SPSS, and R was used for the analysis. Lastly, the survey data were merged with the retention data.

4.3.2 Qualitative data

To answer the second question as to why committed learners in IOL 2 did not complete the course, data for analysis were based on survey respondents who stated that their initial aim was to complete the course and had also stated in the survey that they did not complete. The elicited text data from these users who answered the survey's open question were then found and a sample group was created. The study was guided by analytic induction (Creswell, 2013; Taylor & Bogdan, 1998) in order to identify meaningful patterns or themes across the data (Hsieh & Shannon, 2005). A summative approach was used to interpret the content of the text data, focusing on expressions of disengaging elements in terms of retention (Hsieh & Shannon, 2005). The study employed open coding (Creswell, 2013) based on labeling relevant words or repeating content that emerged from the data, followed by an interpretation of the contextual

meaning of the content (Hsieh & Shannon, 2005). Finally, to extract content categories from the data, relevant codes were connected into overarching themes until the new data reached saturation (Creswell, 2013; Taylor & Bogdan, 1998).

First, the overall retention rate measured by the tracking data was investigated. Next, the survey data regarding learner experiences on content-specific factors were explored and compared to the tracking data. Then, the survey data from those who had stated that their initial intent was to complete the course and who had also self-reported non-completion were investigated. Finally, qualitative survey responses from learners who claimed they had the intent of completing the course but did not do so were examined.

5. Results and discussion

Each research question will be addressed in turn. The first is whether learners in IOL 2 considered the content-specific factors important for their motivation and whether they influenced retention. Second, discussed in section 5.2, is why learners who intended to complete the course did not succeed in doing so.

5.1 Content-specific factors in terms of learners' motivation and retention

To address the first research question of whether or not students in IOL 2 considered the content factors important for their motivation to carry on in the course, the survey responses ($n = 400$) were tabulated in regard to the six content-specific factors. As Table 1 shows, the sample contains respondents who thought of these factors as significant motivators (marked “strongly agree”/“agree” or “definitely”/“probably” in relation to relevant statements), against respondents who did not consider them important for motivation (marked “neither agree nor disagree”/“disagree”/“strongly disagree” or “possibly”/“probably not”/“definitely not”).⁴ First, the two factors concerning the structure and organization of the course content are considered and then the factors regarding the pedagogical principles.

Considering first the factor of curated and sequenced course structure in Table 1, the findings show that 73.8% ($n = 295$) of the participants responded that this factor was important for their motivation. Related to this factor, the survey asked two additional questions of whether participants found the website to be easy or difficult to navigate and whether they accessed the material in the suggested order. The data revealed that 80% ($n = 320$) found the navigation easy and that

Table 1. Students' reports on the importance of content-specific factors in IOL 2 for their motivation

	Important for motivation	Not important for motivation
Curated and sequenced course structure	73.8% ($n = 295$)	26.2% ($n = 105$)
Clear and salient learning objectives	55% ($n = 220$)	45% ($n = 180$)
Gradual and scaffolded presentation of input	84.8% ($n = 339$)	15.2% ($n = 61$)
Variety in types of learning objects	82.2% ($n = 329$)	17.8% ($n = 71$)
Continuing storylines	69.8% ($n = 279$)	30.2% ($n = 121$)
Form-focused and scaffolded presentation of grammar	66.2% ($n = 265$)	33.8% ($n = 135$)

⁴Based on Research Question 1 and in the attempt to report simpler analysis results, the data were collapsed down to a dichotomous scale (those who found relevant factors important for motivation versus those who did not) in the analysis phase of collected data (Jeong & Lee, 2016). When participants marked “don't know”/“choose not to answer,” they were considered as those who did not experience a factor important for motivation. For details, please see Appendix A in the supplementary material on the breakdown of the data according to each point on the scale.

88% ($n = 350$) navigated through the course as suggested. The results on the second factor of clear and salient learning objectives show that 55% ($n = 220$) considered it to be important for their motivation. In a related question that asked whether the presentation of learning objectives helped to keep them focused, the data showed that 60% ($n = 240$) considered such presentation of objectives helpful. In another related sub-question on whether participants would have preferred to set their own learning goals, only 22.8% ($n = 91$) agreed.

In Table 1, the third factor of gradual and scaffolded presentation of input stands out as it is considered to be important for motivation in 84.8% ($n = 339$) of the cases. The fourth factor, variety in types of learning objects, turns out to be the second-most important factor with a response rate of 82.2% ($n = 329$). Four sub-questions on the learning objects were then addressed: (a) whether the learners perceived that the diverse learning objects were fun to work with, (b) whether they were clearly presented such that the users understood what to do, (c) whether the learners accessed the attached audio files, and (d) whether they asked for feedback on their learning objects. The results show that 88.8% ($n = 355$) stated that the variable exercises made the course fun and that 81.2% ($n = 325$) claimed that they were clearly presented, while 78.8% ($n = 315$) stated that they accessed the audio files frequently, and 77.5% ($n = 310$) asked frequently for feedback. For the fifth factor in Table 1, continuing storylines, the findings show that 69.8% ($n = 279$) of the participants responded that this factor was important for their motivation, and when asked in a sub-question whether using the storylines made the course fun, 72% ($n = 288$) agreed.

Finally, regarding learners' experiences of the form-focused and scaffolded presentation of grammar factor, 66.2% ($n = 265$) considered this kind of grammar presentation helpful in keeping them motivated. In relation to this factor, the survey asked whether they used the grammar help provided or went to the second step in the grammar resource. The data show that 50.8% ($n = 203$) stated that they frequently used the grammar help and that 63.2% ($n = 253$) sought more information in the grammar resource.

In summary, the data reveal that most of the users consider all these factors to be important motivators, indicating that the instructional methodology and engagement strategies employed in IOL 2 are useful in encouraging learners. These findings relate to previous studies highlighting the value of MOOC structural design that a curated and salient structure of course content, where learning goals are spelled out in advance, may be of benefit to motivate learners and keep them focused (de Larreta-Azelain, 2014; Dörnyei *et al.*, 2014; El Said, 2017; Hubbard, 2013). Furthermore, the data show that gradual and scaffolded presentation of input is highly appreciated by the learners, which contributes to earlier arguments of the necessity of providing scaffolding of course content and activities in such environments (de Larreta-Azelain, 2014; Doiz *et al.*, 2014; Hew, 2016; Teixeira & Mota, 2014). The results also support previous evidence that an appealing and entertaining learning context is an important factor in evoking and maintaining learners' motivation (de Barba *et al.*, 2016; Friðriksdóttir, 2019; Hew, 2016). Moreover, the findings imply that technologically enhanced devices may encourage the LMOOC learner (Arnbjörnsdóttir, 2004; Chun, 2012; Colpaert, 2010, 2014).

To address the question of whether learners who valued these content-specific factors as important motivators are more likely to complete than those who disagreed, survey data ($n = 400$) were tabulated with regard to the factors and were then measured against tracking data (Table 2).

Focusing first on the factor of curated and sequenced course structure, the outcome shows that 45.8% ($n = 135$) of those who found this factor to be important for their motivation completed the course, whereas only 38.1% ($n = 40$) of those who did not agree completed. Concerning the second factor of clear and salient learning objectives, the findings show that 42.7% ($n = 94$) of those who considered this factor important for their motivation completed the course, in comparison to 45% ($n = 81$) of those who disagreed. For factor three, gradual and scaffolded presentation of input, 46% ($n = 156$) of those who identified this factor as important completed the course, as compared to only 31.1% ($n = 19$) of those who disagreed. Regarding the fourth factor, variety in types of learning objects, the results show that 45% ($n = 148$) of those who

Table 2. Retention of learners who considered the content-specific factors in IOL 2 important for their motivation as opposed to those who did not

	Important for motivation		Not important for motivation	
	Completed	Did not complete	Completed	Did not complete
Curated and sequenced course structure	45.8% (<i>n</i> = 135)	54.2% (<i>n</i> = 160)	38.1% (<i>n</i> = 40)	61.9% (<i>n</i> = 65)
Clear and salient learning objectives	42.7% (<i>n</i> = 94)	57.3% (<i>n</i> = 126)	45% (<i>n</i> = 81)	55% (<i>n</i> = 99)
Gradual and scaffolded presentation of input	46% (<i>n</i> = 156)	54% (<i>n</i> = 183)	31.1% (<i>n</i> = 19)	68.9% (<i>n</i> = 42)
Variety in types of learning objects	45% (<i>n</i> = 148)	55% (<i>n</i> = 181)	38% (<i>n</i> = 27)	62% (<i>n</i> = 44)
Form-focused and scaffolded presentation of grammar	43.4% (<i>n</i> = 115)	56.6% (<i>n</i> = 150)	44.4% (<i>n</i> = 60)	55.5% (<i>n</i> = 75)
Continuing storylines	43% (<i>n</i> = 120)	57% (<i>n</i> = 159)	45.5% (<i>n</i> = 55)	54.5% (<i>n</i> = 66)

reported this factor to be important for their motivation completed, while only 38% ($n = 27$) of the other group completed. For the fifth factor of form-focused and scaffolded presentation of grammar, the study found that 43.4% ($n = 115$) of those who considered it important for their motivation completed, while 44.4% ($n = 60$) of those who disagreed completed. Finally, when observing the impact of the factor of continuing storylines, 43% ($n = 120$) of those who valued it important for their motivation completed, while 45.5% ($n = 55$) of the other group completed.

The results in Table 2 indicate that there is a positive association between three of the factors and course completion; that is, the factors of curated and sequenced course structure, gradual and scaffolded presentation of input, and variety in types of learning objects. When measured against the tracking data, participants who considered these factors important for their motivation were more likely to complete the course than those who did not consider them important. A chi-square test of homogeneity indicates statistically significant differences in completion rates ($p = 0.0439$) between those who experienced the factor of gradual and scaffolded presentation of input to be important for their motivation and those who did not. However, no statistically significant differences were found in completion rates between the two comparison groups regarding the factor of curated and sequenced course structure ($p = 0.2129$) or the factor of variety in types of learning objects ($p = 0.3474$). The other factors in Table 2, clear and salient learning objectives, form-focused and scaffolded presentation of grammar, and continuing storylines, were not found to have a positive impact on course completion in the study. This result suggests that course developers should pay more attention to these factors. The findings contribute to the arguments that course content needs to be curated for the online language learner (Hubbard, 2013) and that a scaffolded approach and structured support (Arnbjörnsdóttir, 2004; de Larreta-Azelain, 2014; Sokolik, 2014; Teixeira & Mota, 2014) as well as varied course content (de Freitas *et al.*, 2015; Doiz *et al.*, 2014) may be critical to engage and retain the LMOOC learner.

To conclude the findings regarding the first research question, most of the participants, or between 55% to 85% of them, found value in all the content-specific factors for their motivation to continue the course, in particular factors related to gradual and scaffolded presentation of input and the variety in types of learning objects. As the major goal of the IOL course was to engage learners and support their learning process, the majority of the survey respondents demonstrated that the course was successful. When measured against the tracking data, those who considered three out of the six factors to be engaging elements were in greater likelihood of completing than those who did not, where the factor of gradual and scaffolded presentation of input was found to have a statistically significant association with course completion. Overall, the study identified various elements of LMOOC course design and CALL practices that seem to promote learner engagement and, in some cases, retention.

5.2 Reasons for non-completion of the course

To answer the second research question, which asked learners in IOL 2 why they did not complete the course, the survey data on respondents' stated reasons for not completing the course were tabulated depending on the text data. Out of the 107 learners who received this question, 62 provided written comments and each of these was explored for common themes. The thematic analysis revealed four main themes: lack of time, inappropriate proficiency level, still working on the course, and lack of motivation.

Data analysis illuminated that the "lack of time" theme distinguished itself as the most frequently reported cause of non-completion from 38 respondents. Further clarification on this term from many of the participants showed that other priorities came up in, for example, their personal life; others stated that they still planned to complete the course eventually. The theme of "inappropriate proficiency level" was found 10 times, mainly involving participants who argued that the course was too difficult. Subsequently, two reasons for not completing, "still working on the course" and "lack of motivation," were both referred to nine times. Other less common themes

identified in the data were technical issues, course organization, lack of support/resources, uninteresting content, and needs fulfilled.

The following quotes provided by participants are representative of the most prevalent reasons for disengaging from IOL 2 based on the identified themes.

Lack of time. As this statement implies, time pressure was a critical reason for leaving the course: “Lack of time at the end; but planning on to complete it someday.” (Participant (P) #10)

Inappropriate proficiency level. As this quote suggests, learners may disengage from the course because it is unsuitable for them: “It got too difficult with the grammar without it being better explained in smaller steps.” (P#30)

Still working on the course. This quote reflects how some learners have, in fact, not left the course at all: “I am still following the course and intend to complete it.” (P#146)

Lack of motivation. This informant underlines how poor motivation may affect retention: “Lack of motivation at the end [...]” (P#176)

To summarize the answers to the second research question on the primary reasons that learners left the course, the evidence indicates that crucial factors for them leaving a course may be found outside the course itself. The thematic analysis of their responses revealed that time pressure was a critical reason for leaving. These results support earlier findings that various external and individual factors may be obstacles to learners in such learning environments (Henderikx *et al.*, 2018; Reich, 2014; Shapiro *et al.*, 2017). Added comments from the informants, however, point out that some learners intended to continue the course later. Similarly, the results show that many of the participants who were considered to be non-completers in the study had, in fact, not left the course but had progressed at their own pace. These findings may reflect that students view learning in such open environments as an opportunity for ongoing learning (Shapiro *et al.*, 2017). Furthermore, responses detailing the learners’ struggles support previous findings that their perception of inappropriate proficiency levels may explain student attrition or lack of motivation (de Freitas *et al.*, 2015).

6. Conclusion

The primary objective of this research was to identify important determinants of student engagement and retention in LMOOCs. For this, the study investigated self-reports from 400 learners in IOL 2 on their perspectives of specific content factors in correlation with retention and on possible external factors that may influence retention. The study found that most of the participants considered the course structure, organization, and the instructional design to be important factors for their motivation, and that some of these factors have favorable effects on retention. The data indicate that curated and structured language learning with gradual and scaffolded presentation of input and richly varied course content and activities is appreciated by the beginner language learner and serves as a significant motivator for engagement. Based on the informants’ responses, another major conclusion was that individual and outside factors, such as insufficient time to focus on their studies, may explain why learners who intend to complete LMOOCs leave before completing. The qualitative data analysis reflects the diversity of LMOOC learners who attend with various motives, objectives, and needs that must be considered in the discussion on student retention.

The findings are a component of a larger study on student retention and their experiences when using LMOOCs. This investigation provides new self-reported data on the influence of content-related elements on engagement and retention in correlation with tracking data, along with disengaging factors in a beginner course, but there are some limitations that must be mentioned. The current research sample reflects a limited population of enrollees in IOL 2, or 15.4%, in the period

under investigation. The low response rate may be due to the fact that the enrollees may not have been involved with the course for some time and that some may have been unable to participate because the survey was in English. As the study used a post-course survey, this may also have affected the low response rate. Future studies should include questionnaires at different levels of the course to promote survey participation. It should also be mentioned that the selection of the study's sample may have affected the results since the answers to questions of experience and meaning relate to users' social affiliations and various age groups where instructional needs may differ. Supplementary studies are essential to investigate the benefits of content factors and pedagogical design for advanced learners and different age groups. This study provides a basis for further investigation of content factors in LMOOCs and engagement strategies in CALL, since the new IOL tracker gives the opportunity to measure the effect of different types of tasks on student engagement in more detail, such as what types learners mostly engage with. Although this study provides valuable insight into critical factors of attrition by using an open-ended questionnaire, there are some limitations that must be acknowledged. Future studies should draw upon multiple methods and sources of qualitative data, such as interviews, to provide a more detailed picture of the setting and strengthen the validity of interpretations in this study. For future research, it would be possible to replicate this study in different settings, as the IOL program has been reproduced and made available for other languages.

This study has contributed wide-ranging data from different sources on the perspectives of LMOOC learners in the context of their learning material and illuminates how numerous course-related and external aspects may affect retention. It provides a new framework on how to promote student engagement and suggests specific strategies involving thoroughly structured and organized content, scaffolding of input and instruction, and a diverse learning context for educators and LMOOC developers to use. The study also offers a new perspective on how to measure completion by including users who cover course content almost to the end. One of the main implications of the study is the suggestion that more use should be made of tracking devices built into LMOOCs to obtain a nuanced picture of learners' actual involvement throughout a course and to provide a better understanding of curriculum impact. Finally, because this study and its previous phase capture the learners' thoughts on why they did or did not complete a course, the research contributes a broader perspective on critical factors in LMOOC retention.

In conclusion, the findings emphasize the importance of considering engaging content for learners in the growing LMOOC field while acknowledging that non-course-related factors may hinder them from participating. While the current study investigated the impact of content factors individually, future research could also conduct a regression analysis to describe the relationships between these variables and retention to make predictions about significant elements of LMOOC retention.

Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/S0958344021000069>

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