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A critical review of design features of LMOOCs

Sin Wang Chong^{a,*} , Muhammad Aamir Khan^{b,‡}  and Hayo Reinders^c 

^aQueen's University Belfast, Belfast, UK; ^bThe Education University of Hong Kong, Ting Kok, Hong Kong; ^cKing Mongkut's University of Technology Thonburi, Bangkok, Thailand

ABSTRACT

There has been an exponential growth in Language Massive Open Online Courses (LMOOCs) in the past decade. LMOOCs have also become an emergent and topical area of research in CALL, in particular, *vis-a-vis* learners' perceptions and experiences. However, not much attention has been paid to analysing the features of LMOOCs. We argue that a systematic investigation of LMOOC design features is vital, especially in light of recent criticisms by some CALL and language education scholars regarding the incompatibility between LMOOC designs and language teaching and learning theories and methodologies. This systematic review, which employs Hall's (2013) framework of web-based instruction, addresses this gap by analysing instructional and assessment features of 100 LMOOCs on *edX* and *Coursera*. The synthesised findings suggest three strengths of LMOOCs: Most LMOOCs are introductory, suitable for beginning language learners (*directionality*). Most are easy to navigate because of their *consistency* in format and features. And most employ a range of multimodal instructional materials (*multimodality*). Three limitations are also identified: There are few opportunities for instructor-learner and learner-learner interaction (*interactivity*) and learner-centred, formative assessments (*accountability*). Besides, LMOOCs are designed with a prescribed learning sequence without addressing individual learner differences (*adaptability*). Based on our analysis, practical suggestions for LMOOC developers are discussed.

KEYWORDS

LMOOC; MOOC; review; web-based language learning


1. Introduction

Broadly speaking, two types of MOOCs are recognised: *xMOOCs* are designed following a behavioural approach to teaching and learning, and *cMOOCs* are underpinned by a connectivist and constructivist view of education. Language MOOCs (LMOOCs) are 'dedicated web-based

CONTACT Sin Wang Chong  S.Chong@qub.ac.uk  Queen's University Belfast, Belfast, UK.

*Queen's University Belfast, Northern Ireland, UK; University of St. Andrews, Scotland, UK; Institute of Education, University College London, UK

‡Hong Kong University of Science and Technology, Hong Kong SAR

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online courses for second languages with unrestricted access and potentially unlimited participation' (Bárcena & Martín-Monje, 2014, p. 1). In line with the definition, this review focuses on LMOOCs on language learning but not content-based, culture learning MOOCs which are associated with the language. Luo and Ye (2021) estimated that, as of January 2021, there were over 1,000 LMOOCs. LMOOCs have been shown to have the potential for supporting language learning (Sokolik, 2014) but have also received their share of criticism, including for not contributing much to the linguistic and communicative competencies of learners (Stevens, 2013). Romeo (2012) goes so far as to comment that 'ESL is all about exactly what the MOOCs specifically, and self-study in general, cannot do'. Other critics, like Vorobyeva (2018), argue that LMOOCs are more useful for developing receptive language skills (reading, listening) than productive ones (speaking, writing) because the latter would require more personalised feedback and practice. Whether for these reasons or others, studies of LMOOCs have reported low engagement and completion rates (as with other MOOC subjects). Focusing on a French MOOC, Beaven et al. (2014) found that the major factor negatively affecting learners' motivation to complete a LMOOC is their limited time. Learners of LMOOCs are usually adult learners who have all sorts of personal and professional commitments, making it difficult for them to juggle their responsibilities with learning.

Another criticism is that LMOOCs incorporate learning features commonly found in content-focused MOOCs, including videos, a linear learning sequence, and module-based course organisation. These LMOOCs follow the practices of xMOOCs, which are disciplinary, content-based MOOCs developed by universities with a fixed syllabus and a clear sequence of course completion (Jitpaisarnwattana et al., 2019). They run counter to what CALL researchers have advocated for, i.e. an instructional model of LMOOCs emphasising interactivity and community building (Mackness et al., 2013) - one in which learners are given the flexibility to network with peers through various technological tools (e.g. videoconferencing software) to complete various technology-mediated tasks and achieve the learning outcomes of LMOOCs (Chong & Reinders, 2020). cMOOCs, to their proponents, are more effective for second/foreign language learning and are better aligned with language teaching methodologies such as communicative language teaching (Richards, 2006).

Designing LMOOCs is clearly a challenging endeavour and one for which teachers and course designers need to develop a specialised set of skills. For instance, Read and Bárcena (2013) suggest that language teachers who develop LMOOCs need to acquire an entirely new repertoire of online language teaching skills, giving rise to the need to develop

LMOOC developers' and instructors' technological pedagogical content knowledge (Mishra & Koehler, 2006). In addition, it is necessary to develop a deeper understanding of the unique features of LMOOCs, something that to-date has not been explored in detail.

2. Major trends in LMOOC research

Although research on LMOOCs is growing, most publications are in conference proceedings with few studies published in international refereed journals (Sallam et al., 2020). The majority of the studies focus on the experiences and perceptions of LMOOC participants. For example, in their qualitative study focusing on Chinese learners, Luo and Ye (2021) identified five types of factors that affect learners' perception of the quality of LMOOCs: teacher criteria, teaching content criteria, pedagogical criteria, technological criteria, teaching management criteria. Similarly, Ding and Shen (2019) reported on a case study of an EFL MOOC in China, with a particular focus on the role of the LMOOC in promoting learner autonomy and the metacognitive strategies used by learners. Their findings suggest that learners employed a range of metacognitive strategies to regulate their emotions and motivation while exhibiting varying extents of autonomous learning. Investigating a French MOOC, Beaven et al. (2014) discussed factors affecting learners' intrinsic motivation, including intrinsic value, effort, pressure, utility value, and relatedness (p. 61), and suggested that LMOOC designers should cater for learner differences. The study by Agonács et al. (2020) attempted to identify highly self-determined learners; to their surprise, only 4.31% of the learners surveyed fell into this category. In other words, almost all learners enrolled in LMOOCs are not highly self-regulated learners; they concluded their study by advising LMOOC developers to facilitate the development of learners' self-determined learning skills, including goal setting, reflection. Through analysing learners' comments on an Irish MOOC, Mac Lochlainn et al. (2020) underscored the influence of learners' cultural backgrounds in influencing their engagement with LMOOC activities. The above findings demonstrate that LMOOC participants have diverse needs and backgrounds, as well as high expectations for the quality of online instruction. This warrants a critical review of instructional features in existing LMOOCs on which evaluations and recommendations can be based.

Another strand of research focuses on the interactions and participation of LMOOC learners. Using learning analytics data, Martín-Monje et al. (2018) aimed to understand online interactions in LMOOCs. Their findings suggest that short videos are the most frequently used content on LMOOCs, as are automated grading activities. Their analysis also

indicates that the most common type of learners is ‘viewers’, who frequently access learning materials without engaging or submitting, leading to low completion rates. They suggested the introduction of micro-credentials (e.g. digital badges) to motivate learners to participate. Zeng et al. (2020), drawing on learning analytics data in LMOOCs, examined the participation patterns of learners. They found that high-performing learners distinguished themselves from others in terms of their sustained attention throughout the course. Another result from their study is that most learners followed the suggested learning sequence with no specific learning resources dominating the collective attention flow, something which is contrary to what Martín-Monje et al. (2018) found. It appears that its capacity for facilitating interactions between learners is one of the keys to measure the success of a LMOOC. Therefore, in this review, we have included interactivity as one of the analytical foci.

Feedback is another emergent research interest in LMOOC literature, with a particular focus on peer feedback. Gilliland et al. (2018), in their autoethnographic reflections, observed that learners in a second language writing LMOOC did not have experience providing peer feedback, resulting in generally low quality of feedback for peers. Clifford et al. (2019), examining peer correction in a German MOOC, found that a positive classroom atmosphere was a determining factor for facilitating peer feedback. The emphasis on formative feedback suggests that diverse and learner-centred assessment plays an important role in assisting learners to progress in LMOOCs; this informs our decision to incorporate the evaluation of assessment tasks of LMOOCs in this review.

As can be seen from the above, LMOOC research remains an embryonic field with attention mostly paid to the experiences and views of learners. Critiques of LMOOC features are often in the form of commentaries or narrative reviews but are not obtained or reported systematically. This study, which is a systematic review of instructional and assessment LMOOC features, aims to provide a more objective overview, and from there, offer suggestions for LMOOC developers.

3. Methodology

For the current study, we conducted a systematic review of 100 LMOOCs. Systematic review usually focuses on published literature and is useful for evaluating and aggregating previous studies on a selected topic, identifying knowledge gaps, defining future research directions, and bridging the research-practice divide (Chong, 2020; Lee et al., 2019). Systematic reviews are not uncommon in CALL literature, and they are mainly used to curate evidence-based pedagogical practices (Chong &

Reinders, 2021). Systematic reviews reduce research bias by following a set of pre-determined search protocols, including, for example, search strings, inclusion and exclusion criteria (Chong & Plonsky, 2021). In our case, systematic review techniques were employed to curate and analyse the design features of 100 LMOOCs. Employing the model of web-based design for learning by Hall et al. (2013), features of 100 LMOOCs on the two most popular MOOC platforms, edX and Coursera, were analysed with reference to seven components: *directionality*, *usability*, *consistency*, *interactivity*, *multimodality*, *adaptability*, and *accountability* (Table 1). To the best of our best knowledge, a design model for analysing LMOOCs is non-existent; design frameworks for content-based MOOCs can be found (e.g. Drake et al., 2015; Gynther, 2016) but may not be the most suitable to analyse LMOOCs because of their inherently different nature (i.e. knowledge transmission versus language acquisition). Hall et al. (2013) framework was selected because it is one of the latest design frameworks for web-based instruction, and it encompasses essential aspects of language learning and teaching, including components on ‘interactivity’ and ‘adaptability’.

Although we are aware that there are various other platforms offering LMOOCs, we decided to focus our review on two major platforms: *Coursera* and *edX*. The reason is their massive number of enrolments and the wide range of languages covered. The next section documents the review process, which is summarised in Figure 1.

3.1. Stage 0: Initial review

To identify LMOOCs, we first explored different online platforms, namely *Coursera*, *edX*, *FutureLearn*, *Udacity*, *Khan Academy*, and *LinkedIn Learning*, on which LMOOCs launched by different universities or organisations can be found. After the initial review, we decided to focus on the two biggest e-learning platforms: *Coursera* and *edX* (Coursera, 2021; edX, 2020). Other e-learning platforms were excluded from this review because (1) the review team did not have access to LMOOCs on those

Table 1. Web-based design framework (adapted from Hall et al., 2013).

Component	Key question for LMOOC developers
Directionality	Who is your intended audience (e.g. advanced learners)?
Usability	How is user-friendliness considered to ensure learners’ experiences are stress-free?
Consistency	How do you maintain consistency in relation to higher-order course organisation?
Interactivity	How do you promote teacher-learners and learner-learner interactions? How do you strike a balance between synchronous and asynchronous interactions?
Multimodality	What multimodal materials are included?
Adaptability	How do you personalise the learning experiences of learners with different needs?
Accountability	How are learners assessed?

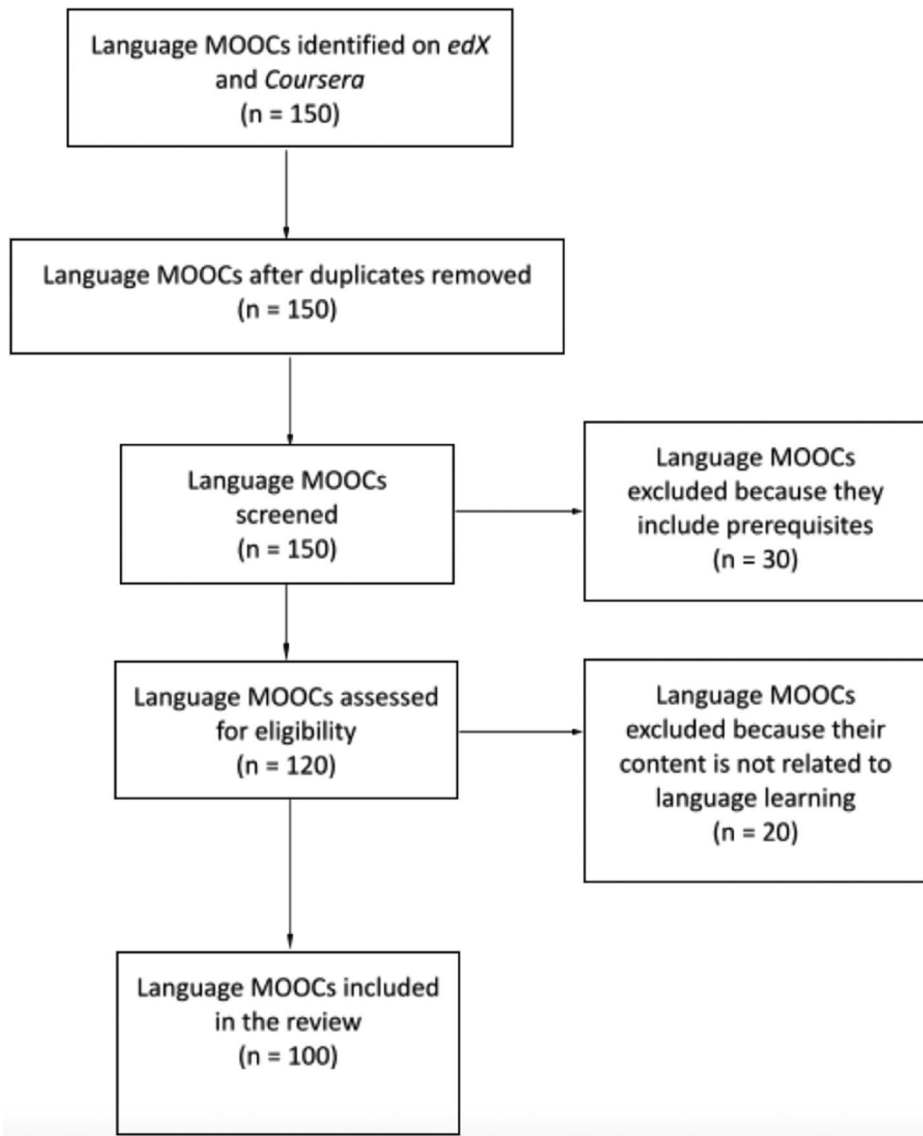


Figure 1. A PRISMA diagram showing the review process of LMOOCs.

platforms or (2) the LMOOCs were not available for enrolment at that time. We acknowledge that this is one of the limitations of this review.

3.2. Stage 1: Review planning

At this stage and based on the guidelines outlined by Lee et al. (2019), we designed the protocol for the search. The developed protocol was then reviewed by the first author, who is a specialist in systematic literature review, and revised accordingly. The protocol included a search

strategy and LMOOCs selection criteria. The details of the review protocol are provided in the following subsections.

3.2.1. Search strategy

The search strategy included specific terms used to conduct searches on *Coursera* and *edX* between mid-August 2020 and mid-September 2020. The individual search terms and their combinations are presented in [Table 2](#). Both search terms and search strings were used to conduct the search.

3.2.2. Selection criteria

A set of inclusion and exclusion criteria were designed ([Table 3](#)). In short, a LMOOC was considered to be relevant if it has an explicit and primary focus on language learning. For instance, LMOOCs should include topics related to a particular language or language skills, e.g. grammar, writing. Courses were excluded if they had prerequisites. For example, the few courses which require learners to complete and pass a beginner-level course before enrolling were excluded because we could not gain access to the content (e.g. ‘Mandarin Chinese for Intermediate Learners: Capstone Project’). Based on these criteria, we screened the course introduction pages of each of the 150 LMOOCs. This resulted in a total number of 100 courses (55 on Coursera and 45 on edX).

3.3. Stage 2: Assessment of eligibility

The first two authors independently reviewed each of the selected LMOOCs by going through the modules and their content. Discrepancies were resolved through discussions using Skype and emails. Ultimately, the total number of LMOOCs included in this review is 100 (55 courses on Coursera and 45 courses on edX) (for a complete list of the 100 LMOOCs, refer to [Supplementary Appendix A](#)).

Table 2. Search terms and strings for locating LMOOCs.

Primary search terms	Language, Language learning
Secondary search terms ^a	English, Chinese, French, Italian, Spanish, Japanese
Search string	‘Chinese’ AND ‘Language,’ ‘French’ AND ‘Language Learning,’ etc.

The decision to focus on these languages was made based on a preliminary review of the LMOOCs available on the two platforms (see Stage 0: Initial Review).

Table 3. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Focus on language learning	Focus on content subjects
Do not include prerequisites	Include prerequisites
Free to enrol	Require registration fee

3.4. Stage 3: Data extraction and synthesis

It is essential to distinguish between data extraction and data synthesis (Chong & Plonsky, 2021). First, four common features of the LMOOCs (videos, assessments, readings, discussions) were extracted from each of the included courses to an Excel file (Table 4). The extracted features were synthesised using reflexive thematic analysis (Braun & Clarke, 2019). Data were coded deductively (categorising LMOOCs features following Hall, Watkins, and Eller's framework, 2013) and inductively (identifying sub-themes to enrich Hall et al. (2013) framework).

4. Findings

4.1. Directionality

According to Hall et al. (2013), directionality concerns the intended audience of the LMOOCs. Table 5 shows that the majority of the included LMOOCs are for beginning learners.

Also related to directionality are the target languages, as shown in Table 6, with English being the most common, followed by Chinese.

4.2. Usability and consistency

Usability and consistency in Hall et al. (2013) framework concerns two questions:

1. How are LMOOCs designed to be user-friendly?
2. How is consistency maintained in LMOOCs in relation to course organisation?

Table 4. Features extracted from each LMOOC.

Feature	Definition
Video	These are hosted on <i>Coursera</i> and <i>edX</i> or on third-party platforms, e.g. <i>YouTube</i> . Besides receptive videos, some courses also use interactive videos using HTML 5 packages.
Assessment	Both graded and ungraded assessments are used.
Reading	Two kinds of reading content are mostly used: supplementary reading content, which helps learners to enrich their knowledge and develop their skills, and optional reading content in the form of links, book chapters, etc.
Discussion	These include predefined questions which are posted by the instructors to elicit responses/feedback and/or interaction from or among learners.

Table 5. Levels of difficulty of LMOOCs.

Platform	Beginner/Introductory level	Intermediate level	Advanced level	Total
<i>edX</i>	29	12	4	45
<i>Coursera</i>	33	20	2	55
Total	62	32	6	100

Table 6. Target languages of LMOOCs.

Platforms	Languages	No. of LMOOCs
edX	English	30
	Italian	5
	Spanish	4
	Japanese	3
	Chinese	2
	French	1
Coursera	English	36
	Chinese	8
	Spanish	5
	Russian	5
	French	1

LMOOCs on both *edX* and *Coursera* have a consistent pattern of presenting course content to learners. Structurally speaking, the included LMOOCs show very similar organisation, including an ‘About Page’, which contains details about the course, namely syllabus, duration, commitment needed, language(s) in which the course is to be taught. This information provides an overview of the LMOOC to the learners and helps them decide whether the course is suitable for them.

The content in the LMOOCs is categorised into weeks or modules. The minimum duration of the LMOOCs on both platforms is three weeks. The maximum course durations are 15 weeks and 14 weeks on *edX* and *Coursera*, respectively. The content of the LMOOCs is designed linearly, and the depth of the content increases as the module progresses. To provide clear instructions to learners, all the LMOOCs have technical guides available or a discussion page where students could share their feedback about the course or raise any problem they face while accessing the content.

Nearly half of the LMOOCs include a combination of all the four focused features, namely videos, assessments, readings, and discussion forums ($n=48$). These components are structured as a learning sequence for a given topic. Generally, a topic starts with an introduction video, followed by quizzes or reading components, and ends with discussion questions to facilitate collaboration between peers. However, three LMOOCs on *edX* only include videos as learning content, without a clear direction of how learners can make use of the video to learn.

Both *edX* and *Coursera* have mobile applications, and the course content on the web version and mobile version is largely identical, making it easy for learners to navigate between learning on computers and on mobile devices. However, some of the quizzes on the computer version are not identical to those in the mobile applications. For example, drag-drop questions are not accessible on the mobile application version. Also, interactive videos are not recommended by platforms to be accessed on the mobile application.

4.3. Accountability

Accountability refers to how learners in the LMOOCs are assessed (Hall et al., 2013). LMOOCs generally have two kinds of assessments: un-graded and graded, closed and open. In the case of *edX*, the graded assessments are only available to verified learners who pay for the course. Most of the included LMOOCs ($n=91$) include summative, closed assessment tasks, which focus on testing learners' understanding of linguistic knowledge. The included LMOOCs incorporate different types of closed assessment tasks into the course architecture, which are often included after the presentation of pedagogical content (Table 7).

Only a few LMOOCs include open-ended assessment tasks, for example, written responses, spoken/video responses, or short-answer quizzes ($n=22$). Other less common types of assessment are LMOOCs peer-assessment ($n=38$) and self-assessment ($n=1$).

4.4. Adaptability

Hall et al. (2013) regard adaptability as an essential feature of web-based instruction. Adaptability refers to the ways online instructors personalise learning experiences for learners with different needs. From the perspective of adaptability, all the included LMOOCs follow a linear learning trajectory and present learning content in modules and weeks, usually from the easiest to the most advanced (see an example in Table 8). In instructor-led LMOOCs ($n=6$), the modules are usually launched weekly, and learners have to wait to access the content in the next unit. For fast learners, the rigidity of these LMOOCs may make them less willing to complete the courses.

On the other hand, in self-paced LMOOCs ($n=94$), all the topics are launched at once, and learners can access any content during a specified

Table 7. Closed assessment tasks in LMOOCs.

Type of assessment task	Number of LMOOCs
Multiple-choice questions	82
True/false questions	33
Checkbox questions	33
Fill in the blanks	32
Drop-down menu	18
Yes/no questions	12
Drag-drop questions	9

Table 8. Learning sequence of 'Russian Alphabet'.

Overview
Week 1: Introduction to Russian Alphabet
Week 2: Russian Vowels
Week 3: Russian Consonants
Week 4: Revision

duration. In this way, learners are given the liberty to skip any content and move forward as they like.

4.5. Interactivity

Interactivity in web-based instruction is defined as ways LMOOCs promote teacher-learner and learner-learner interaction (Hall et al., 2013). Almost half of the LMOOCs include discussions (n=48). Some include interactive tasks that require collaborations between learners to solve communicative problems in authentic scenarios (n=48). Also, the communications usually take place by having learners respond to and discuss pre-set questions in written form. Generally, participation rates in these discussion threads are relatively low; this may be a result of the ambiguous nature of the questions (see examples in Table 9), which discourages learners from sharing their responses or providing feedback. Table 9 categorises discussion tasks in the 100 LMOOCs and the response rates of the learners.

Most of the discussion tasks require learners to introduce themselves in the target language in an attempt to build a supportive learning environment.

Table 9. Types of discussion tasks in LMOOCs.

Discussion task	Example	Number of discussion task	Average learners' participation rate (%)
Writing practice	<i>In your journal this week, write a paragraph about your strengths and weaknesses in writing. What is your plan in going forward? What steps will you take to improve? Post your ideas in the discussion area and read and comment, as always. (Academic and Business Writing, edX)</i>	45	10
Introduction	<i>Introduce yourself in Noongar (Noongar Language and Culture, edX)</i>	41	25
Feedback and scenarios	<i>Do you think verbal or non-verbal communication is more important in deciding whether you perform well in a Job Interview? Which one is more difficult for you to control? Share your experiences with each other and the methods you use to improve. (English for Effective Business Speaking, Coursera)</i>	34	10
Sharing of experience	<i>Do you think the audience should always come first in communication? Can you share some comments and examples of what could happen if you do NOT conduct an audience analysis? Perhaps you can share some of your experiences of when you did not think of the audience first before communicating your ideas. (Business English: Basics, Coursera)</i>	29	15

Learners are usually asked to provide their feedback on certain issues and situations. On casual observation of the publicly available comments, this category of discussion has an average learner participation rate of approximately 10%, which shows that learners participate very sparingly. Sharing personal opinions is intended to elicit learners' prior knowledge and experience about culture or daily life. The participation rate in this category is approximately 15%, which shows that learners are moderately interested in participating in such discussions. The discussion forums in the LMOOCs have all the questions categorised weekly. Learners can easily find all the related discussion task(s) of the particular week in one place and can participate in their desired threads and share their answers with other learners.

4.6. Multimodality

The use of different types (modes) of learning materials is called *multimodality* (Hall et al., 2013). Multimodal learning materials include not only text but also audio, pictures, videos, and combinations of the above. The learning materials used in the 100 LMOOCs are largely similar, including videos, audio, pictures, and texts (Table 10). The majority (n=87) use several types of learning materials to convey language concepts and information. Modules begin with explanations of content through videos and [supplementary information](#) in the form of texts. The information provided is tested by using different kinds of assessments, followed by discussion threads. However, there are some LMOOCs that only include videos and texts (n=6). Their course designs focus on the delivery of linguistic information and do not include any knowledge checks, additional relevant reading materials, or interactive discussion forums.

Some LMOOCs also include links to external websites or learning platforms in their courses, which enriches learners' exposure to the target language by incorporating authentic learning materials (n=46). External tools include *Quizlet*, *Bookwidgets*, and *Genially* (Table 11).

5. Implications and suggestions

Employing Hall et al. (2013) web-based instruction model, features of 100 LMOOCs on *edX* and *Coursera* were analysed. In terms of *usability* and *consistency*, the LMOOCs include a clear introduction of course

Table 10. Multimodal learning materials used in LMOOCs.

Type of learning materials	Number of LMOOCs
Video	100
Text (e.g. reading passages)	93
Picture	22
Audio	13

Table 11. A summary of the external tools attached to LMOOCs.

Type of external tools	Feature of the tools	Number of LMOOCs (%)
<i>Quizlet</i>	Create flashcards, tests and various interactive games	3
<i>Google Slides</i>	Create presentation content in the web browser that can be integrated into other websites	3
<i>Bookwidgets</i>	Create interactive content, e.g. quizzes, reading exercises, dynamic lessons	1
<i>Minnit Chat</i>	Offer chatroom services that can be integrated into a website or LMS for small or large-scale communities	1
<i>Genially</i>	Create dynamic quizzes, e-posters, video presentations, infographics, etc.	1
H5P tool	Create flashcards, tests and various interactive games	1

objectives and intended learning outcomes. There is a clear progression of the organisational units in the courses. Features on MOOC platforms are consistently used, and clear instructions are provided to help learners complete learning tasks. Desktop and mobile versions of the LMOOCs are available to enable the transition of learning between devices. Technical support and users' guides are available to help learners who face technical difficulties in their learning journeys.

Regarding *interactivity*, aligning with the latest publications in LMOOCs (e.g. Martín-Monje & Borthwick, 2021), among the 100 LMOOCs analysed, only less than half of the courses include discussion tasks. Among those that do, the majority include a discussion task in each module (usually at the end of the module). However, these tasks do not always provide an impetus for learners to engage in discussions (e.g. by providing an information gap); they simply adopt the format of a discussion forum. In fact, some discussion tasks are exercises, which require long answers (e.g. translation).

Concerning *adaptability*, a linear learning trajectory following a traditional course structure is used by LMOOCs; content is presented from the simplest to the most complex. In most of the LMOOCs, similar to observations by Friðriksdóttir (2021), the format of the modules lacks variety; for instance, learners are usually asked to complete some tasks after watching a short lecture video or reading/listening to some materials. More advanced or less committed learners cannot skip units or parts of a unit, especially in instructor-led LMOOCs, where modules are released at a designated time, which may contribute to low completion rates evident in MOOCs in general (Paton et al., 2018). Relating to *accountability*, summative and closed assessment tasks are the most common in LMOOCs. A behavioural instead of constructivist view of learning underpins the design of most assessment tasks, with few formative, learner-centred assessment tasks (e.g. peer assessment).

We acknowledge that developers of LMOOCs face challenges when designing content and activities for language learners. Most evidently,

learning features of LMOOCs are limited by the features enabled or available on the platforms hosting them. Since *edX* and *Coursera* host mostly content-based MOOCs, interaction is harder to support. We also understand that LMOOCs are not intended to replace more formal, face-to-face language courses but rather provide an alternative to them and thus warrant design consideration.

In view of the above design limitations, we offer the following suggestions for LMOOC developers. Our recommendations are informed by a sociocultural and ecological view of language learning (Larsen-Freeman, 2012; Vygotsky, 1978; van Lier, 1997). A sociocultural view of language learning capitalises on the importance of social interactions in developing linguistic competency of a target language. Through teacher-learner and learner-learner exchanges, learners practise using linguistic resources at their disposal, discuss their understanding of language concepts with their peers (*languageing*), and begin the process of internalising those resources; they are also exposed to comprehensible input as well as given to opportunities to produce the target language in written and spoken form. An ecological view of language learning is underpinned by the provision of (virtual) learning environments which cater to individual differences and promote learner autonomy, for example, through incorporating additional and optional learning resources, offering multiple learning pathways, providing timely and personalised feedback, and developing authentic tasks which resemble real-life communication scenarios (Chong & Reinders, 2022). Our recommendations are also underpinned by connectivism and rhizomatic learning to redefine LMOOCs as cMOOCs, for example, by adhering to the connectivity and collaboration principles of cMOOCs instead of xMOOCs, which focus on linear content delivery per se (Cowie & Sakui, 2019). Essentially, we understand a LMOOC as an online learning community rather than a site where information is hosted.

To enhance ‘interactivity’ and ‘adaptability’ in Halle et al.’s (2013) framework, LMOOC developers can create separate spaces for language learning, for example, the ‘social space’ and the ‘classroom’. The ‘classroom’ resembles current LMOOCs on *edX* and *Coursera*, where information and learning materials are stored. Focusing on the dissemination of linguistic knowledge or concepts of communication and culture, learners peruse content (e.g. in the form of a short lecture video) and complete some individual tasks that are designed to check their understanding of the content (e.g. a quiz in MCQ format). To facilitate application of knowledge and practice of language skills, a ‘social space’ can be created for collaborative learning, (a)synchronous feedback dialogues, and provision of individualised learning support (Stickler & Hampel, 2015). When it comes to specific platforms for creating the ‘social space’, MOOC platforms such as *edX* and *Coursera* may not be the ideal option;

instead, platforms such as *Microsoft Teams* are preferred. When used in combination with other tools (e.g. *Microsoft Word*, *Microsoft One Note*), collaborative learning tasks can be designed. For instance, tasks developed on *One Note* or *Word*, when uploaded to *Teams*, can be edited by members of the learning space. In this way, learners can complete communicative tasks synchronously or asynchronously (e.g. a pair of learners can engage in collaborative writing by completing different paragraphs of an essay in the target language) (Hung & Higgins, 2016). In the process of completing collaborative language tasks, learners can practise the use of the target language by not only fulfilling the task requirements but also interacting with their peers through computer/mobile-mediated communication (e.g. resolving disagreements, commenting on partner's work) (Yamada, 2009).

In addition, considering how learners can learn through assessments (what Hall et al. (2013) term 'accountability'), it is essential to create a feedback-rich virtual learning environment in LMOOCs (Guichon et al., 2012; Samburskiy & Quah, 2014); this can be achieved through organising individual or small-group feedback sessions in the virtual social space, for example, using videoconferencing tools (e.g. the 'meeting' function in *Teams*, *Skype*). These feedback sessions can be led by tutors or peers to discuss completed tasks in the 'classroom' or 'social space'. Engaging learners in the feedback process is especially important for assessment tasks, which are more open-ended. In these sessions, tutors and learners can discuss their performance in relation to assessment rubrics or compare their work with their peers' (Chong, 2019). These feedback sessions can also be recorded and saved in the 'social space' and serve as additional resources for learners to access whenever they want to. Alternatively, feedback sessions can be conducted asynchronously. Asynchronous feedback sessions, moderated by a tutor, are best for facilitating peer assessment in which learners are asked to discuss the strengths and weaknesses of an exemplar provided by the tutor. Learners can comment on peers' work through various modes, including written, audio, or video and the tutor can facilitate the discussion by responding to the learners' comments (Hung, 2016; Mahoney et al., 2019).

Another way to increase 'interactivity' in LMOOCs is the inclusion of authentic communicative tasks in the social space of LMOOCs (Chong & Reinders, 2020). Informed by task-based language teaching (Ellis, 2009), communicative tasks need to be designed in a way that resembles real-life situations, includes information gaps, and promotes a focus on meaning-making. Referring to scenario-based learning and problem-based learning, learners can be given an authentic communication 'puzzle' to be solved either individually or collaboratively in the target language (e.g. designing a poster to promote a tourist attraction in the target language).

Through completing authentic language tasks, learners engage actively in *languaging*, the process in which learners negotiate their understanding of linguistic knowledge and concepts they learned in the ‘classroom’ (Swain & Watanabe, 2019). These authentic language tasks can be exhibited in the ‘social space’ to demonstrate learning outcomes; these can also be followed up on by tutors in a feedback session.

The above recommendations underscore the importance of collaboration, feedback, and authenticity through which the target language is actively and frequently used as a means or end in meaning-making in LMOOCs. When implementing these recommendations, several considerations need to be addressed. First, responding to the ‘usability’ and ‘consistency’ requirements in the framework by Hall et al. (2013), LMOOC developers should explore ways to *connect* the two learning spaces to make the navigation between the two seamless. For instance, if the ‘classroom’ space is to be hosted on *edX* or *Coursera*, a clear indication about how and when to join the ‘social space’ is essential. Second, practicality needs to be managed. Since the effectiveness of the ‘social space’ rests on the availability of tutors, it is important for LMOOC developers to budget this into their proposal. It may not always be possible to involve tutors to monitor the course, give feedback, and facilitate discussion. It is therefore advised that in the developmental stage of a LMOOC, language specialists or teachers need to be recruited, aside from instructional designers, who are responsible for creating feedback content in various formats (e.g. video, audio) which can be made available in the ‘social space’. In the long run, artificial intelligence (AI) technology, together with text-mining, can be harnessed to develop an AI tutor who can ‘learn’ from corpora of learners’ texts and speeches and provide feedback on learners’ work based on predetermined response options (Cheng, 2017; Huang & Renandya, 2020). Third, these recommendations shed light on how existing LMOOCs can be incorporated into formal language classrooms (de Jong et al., 2020). Instead of creating the ‘social space’ online, formal language classrooms can serve as the ‘social space’ where learners and teachers engage in active language learning based on the content in the LMOOCs, essentially implementing a flipped classroom model. Ultimately, the incorporation of two interlinked learning spaces operationalises what Godwin-Jones (2014) called the ‘optimal approach to structuring a language learning MOOC’ (p. 8).

6. Conclusion

It is our observation that traditional MOOC platforms (e.g. *edX*, *Coursera*) may not be the most ideal conduit for hosting LMOOCs. While students learning disciplinary knowledge can benefit from a

behavioural approach to teaching and learning, language acquisition and language education research has clearly shown that a communicative approach is more conducive to learning an additional language (Richards, 2006). As shown in our analysis of the 100 LMOOCs, these courses, while informative and easy to navigate, fall short of what is expected regarding interactivity and learner-centered assessment. Our pedagogical recommendations, albeit exploratory, attempt to address these shortcomings by introducing social elements in non-formal, online language learning environments. To this end, we suggest a reconceptualisation of LMOOCs as online learning communities in lieu of repositories of information, suggesting a pedagogically informed combination of MOOC platforms with other technological tools that strengthen connectivity of online learning. Alternative formats of LMOOCs, which emphasises connectivity, including Small Private Online Courses (SPOC), can be explored using these recommendations. Moreover, these recommendations may be useful to classroom language teachers who plan to introduce LMOOC content into their teaching.

This review excludes LMOOCs on university platforms and perceptions of LMOOC developers and learners. To address these limitations, future studies can examine the LMOOC experiences of various groups of stakeholders on a wider range of platforms. Another research direction would be to focus on the efficacy of LMOOCs: quasi-experimental studies can be conducted, with pre-test and post-tests, to investigate the impact of LMOOCs on learners' linguistic development, in comparison with formal language instruction.

Authors' contributions

SWC conceptualised the study. SWC and MAK contributed to data collection and analysis. SWC, MAK, and HR wrote drafts of this manuscript. All authors proofread the final version of the manuscript and gave consent to submit and publish the manuscript.

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Notes on Contributors

Sin Wang Chong, SFHEA, is Assistant Professor in Applied Linguistics and Language Assessment at Queen's University Belfast in Northern Ireland, Affiliated Assistant Professor in TESOL and Academic English at University of St. Andrews in Scotland, and a researcher at the Institute of Education, University College London. He is

Associate Editor of the journals, *Innovation in Language Learning and Teaching*, and *Higher Education Research & Development*.

Muhammad Aamir Khan is a Research Associate at the Hong Kong University of Science and Technology. He received his PhD from Hong Kong Polytechnic University, Hong Kong. His research interest is multidisciplinary, focusing on innovation, work-groups and teams, goal orientation, knowledge management and e-learning.

Hayo Reinders is TESOL Professor and Director of Research at Anaheim University, USA, and Professor of Applied Linguistics at KMUTT in Thailand. He is founder of the global Institute for Teacher Leadership and editor of *Innovation in Language Learning & Teaching*. His interests are in out-of-class learning, technology and language teacher leadership (www.innovationinteaching.org).

ORCID

Sin Wang Chong  <http://orcid.org/0000-0002-4519-0544>

Muhammad Aamir Khan  <http://orcid.org/0000-0003-0334-9411>

Hayo Reinders  <http://orcid.org/0000-0003-3635-1833>

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