

An Observation Protocol for Scaffolding Community of Inquiry and Its Exemplary Practices in Language MOOCs

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ABSTRACT

As a response to a call to investigate the fundamental aspects regarding educational theory, research, designing and teaching of language massive open online courses (MOOCs), this study first developed a community of inquiry (CoI) observation protocol to observe the existing teaching, social, and cognitive presences in language MOOCs and tested its reliability using g-theory analysis. The results showed that the developed observation protocol is reliable, as evidenced by the large proportion of variance attributed to variation across courses rather than across raters. A follow-up d-study suggested that 5 and 11 raters were enough to reach moderate and substantial reliability coefficients, respectively. The study also identified exemplary practices that reflected high-level CoI presences in language MOOCs. The result not only highlighted the need to conduct observational studies to disentangle the dynamic interchanges that occur in language MOOCs but also provided practical guidelines to language educators interested in designing and teaching their own MOOCs.

KEYWORDS

Community of Inquiry, Generalization Theory, Language MOOCs, Observation Study

INTRODUCTION

In recent years, language massive open online courses (LMOOCs) have been considered an effective approach to developing English as a foreign language (EFL) learners' language skill at various levels (e.g., Barcena & Martín-Monje, 2014; Ding & Shen, 2019; Hsu, 2021b; Luo & Ye, 2021; Martín-Monje & Borthwick, 2021; Sallam et al., 2020). They not only allow people to learn regardless of geographic boundaries (Barcena & Martín-Monje, 2014), but also provide rich and authentic target-language environments in which learners can interact, challenge, and negotiate meaning with one another (Chong et al., 2022; Ding & Shen, 2019; Jitpaisarnwattana et al., 2021a; Jitpaisarnwattana et al., 2022c). A recent review further showed that social constructivism was the most frequently mentioned theoretical framework in studying technology-enhanced collaborative language learning (Su & Zou, 2020).

Grounded in a social constructivist perspective on learning, Garrison et al. (2000) proposed the Community of Inquiry (CoI) framework, and reflected the assumption of social constructivism through three basic elements – cognitive presence, social presence, and teaching presence. The CoI framework was originally proposed as a lens for understanding educational experience. Subsequently, it was shown to be effective at explaining meaningful learning, both in non-MOOC online EFL

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contexts (e.g., Assalahi, 2020; Herrera Díaz & González Miy, 2017) and in MOOCs across various domains (e.g., Cohen & Holstein, 2018; Ouyang et al., 2020; Zou et al., 2021).

However, only a limited number of scholars have adopted the CoI framework in their studies of online language teaching and learning (e.g., Herrera Díaz & González Miy, 2017; Yang, 2016), as “less attention has been paid to fundamental aspects such as the educational theory that should sustain LMOOC design” (Sallam et al., 2020, p. 19). Within that small group, hardly any have looked specifically at LMOOCs, or simultaneously at course-design and teaching practices (Goshtasbpour et al., 2020). Perhaps more importantly, this small body of literature has tended to overstate the effects of CoIs on online language learning because it has focused on correlations, either within the CoI framework (e.g., Assalahi, 2020; Smidt et al., 2021), or between the framework and language-learning proficiency (e.g., Mo & Lee, 2017; Wu et al., 2017). At the same time, it has tended to understate how influential the framework has been on online instructors’ course designs and teaching practices. The root of these gaps is that the existing CoI measurement instrument cannot “capture the more nuanced elements of ... [online] educational experiences” (Kaul et al., 2018, p. 1).

Therefore, it is important to develop a reliable and valid CoI observation protocol that the instructors of LMOOCs can follow (Kaul et al., 2018), and the aim of this study is to provide one. Having done so, a worthwhile next step would be to use the developed protocol to identify exemplary practices that reflect high-level CoI (Flock, 2020), with the wider aim of informing educators about effective instructional practices, and ultimately, improving the quality of their courses.

BACKGROUND

Col in Online Language Teaching and Learning

Garrison et al. s’ (2000) CoI framework comprises three core elements – cognitive presence, social presence, and teaching presence – but importantly, it holds that the deepest and most effective learning occurs in the overlaps between and among them. *Cognitive presence*, the basic element in critical thinking, is both a process and a product (Garrison et al., 2000). It describes the extent of a learner’s ability to construct meaning through communication, and consists of a series of cognition-related events including triggering, exploration, integration, and resolution (Garrison et al., 2001). *Social presence*, is considered to be divisible into three categories: affective communication, open communication, and community cohesion. Lastly, *teaching presence* comprises multiple responsibilities, chiefly design, facilitation, and direct instruction (Garrison & Arbaugh, 2007).

Among the few studies have applied the CoI framework to L2 learning, some recent work has sought to establish correlations either between/among the three presences (Assalahi, 2020; Herrera Díaz & González Miy, 2017; Smidt et al., 2021; Zhang & Lin, 2021), or between CoI and language proficiency (Mo & Lee, 2017; Wu et al., 2017). However, these correlational approaches have tended to downplay some nuances and details of how CoIs operate in real online classes (Kaul et al., 2018) and a qualitative look at what happened in the class may fill such gap. In addition, in seeking raw data for qualitative analysis, it is important to include a variety of class activities, such as instructional videos and guidelines for assignments (Kaul et al., 2018).

The Embodiment of Col in LMOOCs

Under a CoI framework, the authors argue that LMOOCs have several major challenges from the dimension of course design and teaching, socialization, and cognition.

As for course design and teaching, major challenges include: (a) Course design and instruction both need to be more structured and professional (Friðriksdóttir, 2021a; Jitpaisarnwattana et al., 2022c; Nie & Hu, 2018; Zhao, 2015), (b) The current LMOOCs need to integrate rich, innovative, and engaging activities, such as online games, vocabulary contests, and/or live chat rooms (Friðriksdóttir, 2021a; Hsu, 2021b; Yaşar, 2020; Zhao, 2015), (c) The teaching materials need to be more closely

connected to students, and allow individualized pathways to learning (Chong et al., 2022; Hsu, 2021a; Jitpaisarnwattana et al., 2021b; Jitpaisarnwattana et al., 2022b; Mac Lochlainn et al., 2021; Martín-Monje et al., 2018; Nie & Hu, 2018), and (d) A lack of teaching presence (Jitpaisarnwattana et al., 2022c).

As for socialization, though close teacher-student and student-student communication has been strongly advocated (Ge et al., 2022; Jitpaisarnwattana et al., 2021b; Jitpaisarnwattana et al., 2022c; Mac Lochlainn et al., 2021; Martín-Monje et al., 2018; Mellati & Khademi, 2020; Nie & Hu, 2018; Wright & Furneaux, 2021), they have always been considered as hard to achieve through LMOOCs, especially student-student interaction (Barcena et al., 2015; Chong et al., 2022; Jitpaisarnwattana et al., 2021a; Jitpaisarnwattana et al., 2022c). For example, Jitpaisarnwattana et al. (2021a) reported that student-student interaction was relatively low in an English LMOOC, and Martín-Monje et al. (2018) found most students in an English LMOOC belonged to the “viewer” profile. It thus points to a need to create course activities that promote group communication and interaction, especially among learners from different cultures and contexts (Mellati & Khademi, 2020).

As for students’ cognitive engagement, scholars have called for improvement to the promotion of students’ active cognitive engagement, to avoid low-impact, one-way teaching (Nie & Hu, 2018; Zhao, 2015). In addition, students preferred learning tasks that gave them a sense of relatedness (Jitpaisarnwattana et al., 2022c). What’s more, reading and listening skills were found to be much easier to transmit to students via MOOCs than other language skills such as writing were (Vorobyeva, 2018). Also, the completion rate may no longer be the only indicator of learning success (e.g., Friðriksdóttir, 2021b; Jitpaisarnwattana et al., 2022a; Mac Lochlainn et al., 2021). Rather, as Jitpaisarnwattana et al. (2022a) argued, success should only be defined by the learners, and LMOOC designers should recognize learners’ various needs and design course contents and activities accordingly in order to meet their learning expectations.

Measuring CoI Qualitatively in the Online EFL Context

The instrument most often used to capture CoI presences is the CoI survey developed by Arbaugh et al. (2008). Despite this instrument’s popularity, it has two important drawbacks in applying it to L2 context. The first is that most recent L2-focused CoI publications (e.g., Assalahi, 2020; Smidt et al., 2021) have adopted Arbaugh et al.’s original 34-item CoI survey without revisions. The situation is further complicated by the fact that some indicators of CoI presence – for example, integration and resolution – do not have corresponding EFL elements. A second concern is that the instrument alone cannot readily capture nuances of the dynamics of real-world situations, and thus may hinder scholars’ descriptions of the formation of online CoIs (Kaul et al., 2018), and fail to inform instructional approach in designing and delivering effective online courses (Fiock, 2020; Szeto, 2015).

The authors therefore argue that observation-based CoI studies – which produce rich information about their selected cases, and teachers in particular (Smit et al., 2017) – could help resolve this impasse. In addition, observation enables a deep and thorough understanding of the collected data, including about what works and what does not work when teaching a particular L2 (Garza et al., 2018). However, a recent literature review on the data sources used in MOOC studies showed that observation was the least used data source, especially when comparing to data sources such as log data, survey, and achievement data (Zhu et al., 2022). An example of using observation is Yang et al.’s (2019) study that used a Classroom Video Observation Framework to study instructional practices in a synchronous Chinese as a foreign language class. As well as the aforementioned strengths of using observation, their study revealed an important limitation in coding. That is, although the three presences included in their coding schema were the three elements in the CoI framework, the presences’ subcomponents did not match those in the CoI framework. Therefore, it remains unknown how CoI could be best implemented in observing online language classrooms. In another study, Berry (2017) proposed an interview protocol based on the CoI framework and used it to analyze 50 hours of video clips from four online classrooms, as well as the focal classes’ associated discussion

posts. This yielded new patterns and codes that had not been identified previously in other online-learning populations (Shea & Bidjerano, 2009; Stodel et al., 2006), which further highlighted the need to develop a qualitative-research tool, guided by the CoI framework, to capture online teaching, activities, and student work.

Accordingly, and building upon the foregoing literature review, this study proposes to develop a reliable CoI observation protocol for learning experiences in LMOOCs. We will then use the developed protocol to identify some exemplary practices in LMOOCs, and summarize these practices for the benefit of instructors in such courses. Our research questions are:

1. What is the reliability of the developed CoI observation protocol?
2. How many raters are needed to maximize the protocol's reliability?
3. Based on the observation results, what practices in the sampled LMOOCs can be deemed exemplary?

METHODS

Sample

The present study selected six English LMOOCs belonging to two popular MOOC learning platforms, Coursera and XuetangX (Shah, 2019), with three courses from each platform. To make them comparable, the authors confined the six courses within undergraduate-level academic English courses. In choosing their sample, they adopted an approach similar to that used by Luo and Ye (2021): at the time of data collection, the chosen courses (a) were all among the top three courses on their respective sites by popularity, and (b) had been available to the public for at least two years. Details of the aims and enrollment numbers of each of these six courses are presented in Table 1. The authors then chose the first two and the last two units in each course as analysis units. That is to say, in total, there were 24 units coming from six different popular LMOOCs chosen for further observation.

Table 1. Aims and enrollment numbers of the six selected LMOOCs

Course	Aim	Approximate enrollment as of September 2021
Course 1	To introduce EFL students to the conventions of using English for academic writing, and to encourage them to engage in such writing within their respective domain specialisms	135,000
Course 2	To teach EFL science students to become effective writers and help them publish scientific articles in their fields	256,000
Course 3	To teach the principles of good writing to EFL students via reflection on their own identities	15,000
Course 4	To teach academic English through comparing Chinese and foreign ways of thinking; cultivating intercultural awareness; and improving the students' language skills through the analysis of vocabulary, sentences and texts	254,000
Course 5	To teach EFL students the writing structures, word choices, and sentence-building techniques appropriate to several standard types of English-language journal articles, as well as writing strategies and the rules of the publication process	25,000
Course 6	To develop EFL students' research and writing skills in academic English	10,000

Development of the Observation Protocol

The authors conducted four rounds of developing the Community of Inquiry in LMOOC Courses (COILMC) observation protocol. The first round was broadly based on Arbaugh et al.'s (2008) instrument, but also relied on the three standards (i.e., observability, transparency, and merging redundant items) proposed by Smit et al. (2017) to revise all items. All items that did not meet the three standards were discussed and revised. The second round of the development of the observation protocol involved integrating findings from some of the most recent studies involving CoI measurement, from three perspectives: (a) their qualitative findings in general (Caskurlu et al., 2021; Fiock, 2020), (b) their findings regarding application of the CoI framework in the field of EFL teaching and learning (Ge et al., 2022; Mo & Lee, 2017; Yang et al., 2019), and (c) their findings about use of the CoI framework to analyze existing MOOC courses (Cohen & Holstein, 2018; Goshtasbpour et al., 2020; Kaul et al., 2018; O'Riordan et al., 2020; Zou et al., 2021). In the third round, to render the original four-point Likert scale from Arbaugh et al. (2008) easier to understand, the authors also developed rubrics for each point. 1-point and 2-point responses would be deemed negative verdicts on the observed dimension, and 3-point and 4-point ones, positive verdicts. Lastly, to further polish the COILMC instrument, the authors provided the protocol to a group of 14 EFL instructors and teaching assistants with online teaching experience (10 of them in LMOOCs) and asked for their advice. The authors revised the items accordingly based on the feedback of the instructors and teaching assistants. After this final round of revision, the COILMC observation tool consisted of 36 items. A detailed description of the revisions can be found in Appendix I. The COILMC protocol is presented in Appendix II.

Rater Training

This study's six raters were recruited research assistants who were interested in teaching EFL online, and had either done so before or learned EFL online for at least a year. The training period lasted approximately three months in spring 2021, during which they met once a week for one and a half hours. The training had three main stages. During the first, the raters gathered and discussed prior CoI-related studies. In the second stage of the training, the lead author chaired a 90-minute discussion with all raters about their understanding of the observation protocol, to ensure that everyone had similar interpretations of each item. Then, in the third and final training stage, all raters observed two similar learning units from two different MOOC courses, and compared their observation results for variations in their scoring and the intentions and CoI understandings that underlay such scoring. They gave special attention to the extreme scores, and thoroughly discussed inter-rater discrepancies until all of them were resolved. To limit the chances that observation sequence would affect the ultimate scoring results, no fixed sequence was used; rather, they were told only that their scoring had to be completed within eight weeks. The raters were reminded to consult the observation protocol, as many times as they needed to, to ensure that their scores were aligned with the manual. They were also asked to create written description comments for exemplary examples for each observed item when observing different units and courses.

Data Analysis

In answering this study's first two research questions, the main statistical approach to computing reliability was generalizability theory (g-theory), which holds that researchers must always consider multiple sources of measurement errors, which are termed "facets" (Shavelson & Webb, 1991). It is especially helpful when trying to disentangle issues related to measurement design (Hill et al., 2012). The facets in this study consist of units (u), courses (c) and raters (r). The authors followed a $r^*(u:c)$ design, in which u are nested within c and crossed with r . After identifying the g-theory design for the current study, the authors proceeded with two separate studies, namely a generalizability study (g-study) and a decision study (d-study) (Huebner & Lucht, 2019), of which the former decomposes the variance of the components, while the latter allows identification of the most cost-effective numbers of each facet, to maximize reliability (Huebner & Lucht, 2019). Both the g-study and the d-study were

performed in R using the gtheory package. To answer the third research question regarding exemplary practices in LMOOCs, the authors first picked those courses with the CoI presence mean scores larger than three as the exemplary courses, and then collected raters' written description comments for the exemplary practices when observing those courses. All comments were coded and analyzed using a bottom-up scheme (Miles & Huberman, 1994) under the different aspect of each CoI presence. The lead author color-coded all documents and summarized indicators that emerged from the exemplary practices. Then, the second author reexamined the coding results, and discussed with the lead author until the final indicators were agreed upon.

RESULTS

Reliability of the COILMC Observation Tool

Table 2 sets forth the results of the g-study, in which four units were nested in six MOOCs and crossed with the six raters, regarding observed teaching presence, social presence, and cognitive presence. The variance in teaching presence that was attributable to MOOC was 78.1%, suggesting that the developed observational tool is quite sensitive to the kind of course that is being observed. The variance in the same aspect of CoI that was attributable the raters was just 2.7%, suggesting that they had been quite consistent in observing teaching presence based on the rubrics provided. The variance associated with the nesting effect was 1.0%, showing that the units nested within each course were quite consistent in terms of their teaching presence. There was also a 15.5% variance ascribable to the interaction between the course and the raters, but an *F* test showed that it was not significant.

The g-study results for social presence exhibited a similar pattern. Of the variance in the observed social presence score, 85.2% was explained by courses, 2.2% by the six raters, 1.3% by the nesting effects, 5.4% by the interaction effect, and the remaining 6% by the residuals.

Lastly, 58.4% of the variance in cognitive presence was explained by courses, followed distantly by the 24.1% accounted for by the interaction between course and raters (which again was found to be non-significant via *F* testing). The percentage of variance from the nesting effect was close to zero: i.e., all four units within a given course tended to show similar observation scores for this type of CoI presence. The rater effect made up 8.1% of the variance, and the residuals about 9.3%.

In sum, the reliability of the instrument across the three presences exhibited ideal reliability. That is, the authors were expecting that the variance associated with the course facet would be very high, and with the other facets, very low. In other words, the observed variations were reflections of variation across courses, rather than of variation across different raters.

Table 2. Variance decomposition for the CoI

	Categories		
Source of variation	Teaching presence	Social presence	Cognitive presence
Course * Rater	15.5	5.4	24.1
Unit: Course	1.0	1.3	0.1
Course	78.1	85.2	58.4
Rater	2.7	2.2	8.1
Residual	2.8	6	9.3
Total	100	100	100

Note. Cells are the percentage of variance accounted for by each facet in the generalizability study.

Number of Raters Needed to Maximize Reliability

Next, the authors used the g-study results to establish the number of raters needed for different levels of reliability (Table 3). In the case of teaching presence, two raters were required for a moderate reliability of .60 to .80, and four, for a substantial reliability, i.e., larger than .80 (Shrout, 1998). For cognitive presence, the parallel numbers were two and five. For social presence, on the other hand, considerably more raters were needed: five and 11 for moderate and substantial reliability, respectively.

Thus, five raters were sufficient if the goal was to reach a moderate level of reliability for the observation protocol, and 11 raters were sufficient if it was to reach a substantial level of reliability.

Table 3. Expected reliability coefficients for each CoI presence, by number of raters

Number of Raters	Reliability Coefficients		
	Teaching Presence	Social Presence	Cognitive Presence
1	.49	.27	.47
2	.66	.42	.64
3	.75	.52	.72
4	.80	.59	.78
5	.83	.64	.81
6	.85	.68	.84
7	.87	.72	.86
8	.89	.74	.87
9	.90	.76	.89
10	.91	.78	.90
11	.91	.80	.91

Exemplary Practices in Observed Courses

Table 4 shows the mean score of the CoI presence in each course. Exemplary practices were then selected from the course with positive verdicts (i.e., scores larger than three) in each CoI presence.

Table 4. Mean scores of the CoI presence in each course

	Teaching Presence	Social Presence	Cognitive Presence
Course 1	2.42	1.98	3.12
Course 2	3.40	3.29	3.42
Course 3	3.46	3.23	3.75
Course 4	3.17	2.61	3.22
Course 5	2.22	1.96	2.55
Course 6	2.60	1.86	3.08

The exemplary teaching practices under the teaching presence is displayed in Table 5. The authors divided the teaching practices according to the three different dimensions of the teaching presence. After synthesizing the exemplary practices, the authors found that many of them were related to the facilitation behavior of teaching. The authors then classified it into four different indicators (Identifying areas of agreement and disagreement, Helping students to clarify their thinking, Keeping members engaged, and Encouraging students to explore new ideas).

Table 5. Exemplary teaching practices under teaching presence

Aspect	Indicator	Exemplary Practices
Design and organization	Clear communication	Setting up sessions such as “Before you start,” “What to expect,” and “How this course works” at the beginning of the course.
	Linking each course component to relevant course topics	Each video clip clearly illustrated the course topic that was then being addressed
	Giving clear explanations of assignments and their goals	“The assessment for this week is a quiz. The quiz will help you test your understanding of this week’s concepts.”
	Due date reminding	Not merely displaying due dates on the course webpage, but also sending email reminders about them
Facilitation	Identifying areas of agreement and disagreement	1) Telling the students to assess writing with a critical mind, and that there is not just one right way to do so 2) Using roundtable discussion sessions to present different views, e.g., when discussing the topic of identity, including multiple persons, each with different stories, backgrounds, and viewpoints 3) Making comparisons between good and bad writing
	Helping students to clarify their thinking	1) Summarizing existing problems, e.g., in one case, the four major challenges to Chinese EFL students seeking to publish English papers 2) Presenting examples 3) Establishing knowledge trees, flow charts or other visualizations to show the interrelations among different topics 4) Providing peer-review opportunities 5) Providing explicit “Future directions” sessions
	Keeping members engaged	1) Conducting polls 2) Using diverse avatars (e.g., to represent students with different cultural and/or knowledge backgrounds) 3) Posing step-by-step questions in videos 4) Setting up roundtable discussion sessions 5) Recording videos in real campus settings 6) Hosting prestigious guest speakers
	Encouraging students to explore new ideas	1) Telling them explicitly to explore new concepts in their own time (e.g., after introducing the concept of lexical density and strategies in class, one instructor encouraged students to think of additional strategies after class) 2) Guiding them to explore new concepts implicitly, through setting up questions after each reading assignment 3) Embedding unfamiliar terms (e.g., run-on sentences, dangling structure, faulty parallelism) in discussions of texts, and encouraging students to further explore those concepts
	Adapting the course for students with different ability levels	1) Having optional components for those who want to publish their articles in English 2) Providing ample further readings and/or videos for those interested in a given topic 3) Holding extra vocabulary sessions, to help those with limited knowledge of vocabulary 4) In the case of courses focused on scientific writing, explicitly showing the learning material’s implications for learners from non-scientific fields 5) Providing two different versions of the lecture with different lengths, to accommodate learners with different learning needs

Table 5 continued on next page

Table 5 continued

Aspect	Indicator	Exemplary Practices
Direct instruction	Providing clear and precise instruction	1) Showing the core concepts in a clear and accurate way in slides 2) Providing both Chinese and English explanations in interpreting difficult points (e.g., when explaining some common mistakes made by Chinese EFL learners, one instructor not only pointed out the dangling structure, but also provided alternative explanations in Chinese) 3) Pausing videos and presenting short pop-up quizzes to facilitate understanding 4) using real writing samples from students of different levels 5) providing high-quality feedback in discussion forums in a timely manner, i.e., within not more than three days

The exemplary teaching practices under the social presence is displayed in Table 6. Compared with the large amount of exemplary practices observed in teaching presence, all raters expressed that it was difficult for the students to perceive classmates as real. This was mainly due to the limited opportunities the focal MOOCs provided for collaboration and discussion. Furthermore, the overall level of group cohesion the raters observed was relatively low, probably due to the limited chances to communicate that the focal MOOCs afforded.

Table 6. Exemplary teaching practices under social presence

Aspect	Indicator	Exemplary Practices
Affective expression	Providing opportunities for learners to know each other	1) Setting up “Meet your classmates” sections in their discussion forums 2) Including posts such as “Finding a language learning partner” that were published by learners spontaneously 3) Assignments that require collaboration were a further channel whereby students could become acquainted
	Seeing the instructor as real	1) Did not read the slides mechanically, but explained the content in a complementary way 2) Exemplified content using personal experience (e.g., one instructor frequently talked about her experience as a member of her department’s hiring committee, to give students a deeper understanding of what good CVs and personal statements look like) 3) Added their personal thoughts to explanations of learning content 4) talked in a manner that suggested they and the students were sitting together in the same room 5) Taught from their real office.
	Seeing classmates as real	1) Self-introduction sessions 2) Submission of assignments to discussion forums. For example, one observation comment said, “I could feel my classmates were real when I checked the writing assignments that they submitted.”

Table 6 continued on next page

Table 6 continued

Aspect	Indicator	Exemplary Practices
Open communication	Encouraging students to express their ideas	“We encourage you to engage in conversation and collaboration in this course, because they are critical components of learning in MOOCs.”
	Providing a large number of opportunities for communication per unit	In one course, although its first unit did not cover very many content-related topics, the instructor still set up two discussion sections simply to facilitate student-student communication
Group cohesion	Seeking the learners’ trust through describing the reputation of the course, the instructor, and/or the institution that the instructor belonged to	“After all, this is a course/professor from ** university.”
	Being acknowledged by the other course participants	1) Someone started a post regarding the use of “we” vs. “I” in a discussion forum. After that, he received 10 high-quality replies from other students discussing this issue in light of their own experiences 2) When another student questioned a part of a lecture about cutting too many words from a sentence, eight students expressed their confusion, and engaged in a heated discussion regarding how many words should be removed from sentences

The exemplary teaching practices under the cognitive presence are displayed in Table 7. We found more exemplary practices were related to the first three stages of cognitive presence (i.e., triggering events, exploration, and integration), while resolution seems to show limited exemplary practices.

Table 7. Exemplary teaching practices under cognitive presence

Aspect	Indicator	Exemplary practices
Triggering events	Posing effective questions to increase students' learning interests	When teaching about how to get one's paper published, a teacher asked a series of questions: What is involved in the submission process? How can I improve my chances of getting my paper published? How should I write a cover letter? When teaching about how to write academic English articles, the same teacher posted questions regarding the common mistakes made by Chinese EFL students when writing academic English papers.
	Increasing learning curiosity via course content	1) A discussion of how to identify lectures' structures and how to participate in seminars was delivered through topics from the life sciences, including brain development, in vitro fertilization, and adolescence 2) In another course, the instructor invited two of her colleagues who were experts in grant writing to join, which greatly raised learners' curiosity
	Embedding recaps of students' previously learned knowledge across units or different parts within a unit	Reviewing unit 1 while learning unit 2
Exploration	The addition of learning materials to enable further learning	1) In a unit on using active voice in writing, the instructor provided an article as a writing sample, and explicitly stated that learners were welcome to use it as a sample of exemplary writing style in their own time 2) Providing further learning materials that were not merely abundant, but also all relevant
	Appreciating a variety of perspectives – e.g., instructor, author, reviewer, and student	Allowing students to understand how such perspectives could lead to different ways of writing or editing
Integration	Integrating new information to help answer questions that were raised	When teaching about how to write scientific news stories, one teacher compared traditional articles against innovative ones, and then introduced the concept of the nut graf to explain the differences.
	Comments	Teachers' comments on writing, which were important to learners' creation of solutions to academic-writing problems
	Encouraging learners to write summaries	Using "do" and "don't" to summarize writing strategies; listing 10 common language errors to summarize learning materials; and establishing a writing routine that helps to construct solutions
Resolution	Explicitly encouraging students to use the knowledge they were acquiring in their MOOCs in other settings	"Please spread the word and pass on the skills you've learned in this class to other scientists to help them become better communicators."
	The learning content itself	Cover letters, grant proposals, as well as its assignment tend to be of great value in students' future lives

DISCUSSION

The Development of COILMC

The findings of this study extend the use of CoI from a widely adopted conceptual framework for understanding online teaching to teaching languages via MOOCs, and confirm the theoretical value of examining the construction of online language-learning communities using a CoI framework (Assalahi, 2020; Herrera Díaz & González Miy, 2017; Mo & Lee, 2017; Smidt et al., 2021; Sun et al., 2017). Specifically, adopting an analytical approach based on g-theory, this study tested the reliability of the developed LMOOC observation protocol – COILMC – and established the number of raters needed for observation using it to reach satisfactory reliability. Our developed and/or revised items in COILMC show that the three presences in the CoI framework were present in all six sampled LMOOCs, both as core elements and as overlaps among each of those three elements (Garrison et al., 2000).

Second, the findings confirm the value of using a structured observation protocol to analyze the “dynamic interplay of various classroom processes and conditions” when studying L2 acquisition (Dörnyei, 2007, p. 178). A direct comparison of our protocol against the survey developed by Arbaugh et al. (2008) reveals four notable differences. The first is a shift from students’ self-reported perspectives to raters’ observational ones. The second is an expansion from items that focused on CoIs in discussion forums only, to include ones that focus on CoIs in all-around online course delivery (Caskurlu et al., 2021; Fiock, 2020), EFL teaching (Mo & Lee, 2017; Yang et al., 2019), and teaching in MOOC contexts (Cohen & Holstein, 2018; Goshtasbpour et al., 2020; Kaul et al., 2018; O’Riordan et al., 2020; Zou et al., 2021). The third is the addition of concrete examples from EFL that correspond to different dimensions within each CoI presence. Last but not least, the COILMC protocol was shown to be of high reliability. By using g-theory (Shavelson & Webb, 1991), the authors were able to examine the reliability of COILMC through partitioning the error variance into different sources of error. The results of the g-study suggested that the highest proportion of variance in observation scores was attributable to variations among the six observed courses. As well as being an obvious sign of the reliability of the instrument, this finding revealed that LMOOCs were indeed at quite different levels in terms of their formation of CoIs. On the one hand, this echoes Ding and Shen’s (2019) comments regarding the “heterogeneous” (p. 3) nature of LMOOCs, in terms of topics, learning materials, and activities; but on the other, it extends such heterogeneity to degrees of CoI. In sum, the authors were able to develop a transparent, contextualized, and reliable observational protocol appropriate for measuring teaching and learning in LMOOCs.

In addition, the results of the g-study revealed somewhat different observation patterns among the rated three presences, which for a teacher’s perspective could aid improvements to course design, and from an evaluator’s perspective, improvements to course observation. More specifically, the variance decomposition for cognitive presence showed a somewhat different pattern from those for teaching presence and social presence. In the case of cognitive presence, course variation was lower (58.4%) than for the other two presences; whereas its rater variation and rater*course variation were higher. All of these findings suggest that reaching a consensus about the observation of cognitive presence is slightly harder than doing so with regard to observation of the other two presences. Indeed, our identification of such variance may help to explain Herrera Díaz and González Miy’s (2017) finding of low scores on all four dimensions of cognitive presence. Despite class activities and learning materials being the same, MOOC learners’ prior knowledge and different backgrounds (Sallam et al., 2020) may lead them to interpret levels of cognitive presence differently; and this highlights the great importance of clearly identifying more individualized learning needs (Chong et al., 2022; Hsu, 2021a; Jitpaisarnwattana et al., 2022b; Mac Lochlainn et al., 2021; Martín-Monje et al., 2018; Nie & Hu, 2018).

Identified Exemplary Practices in LMOOCs and Implications for Teaching

In the dimension of teaching presence, the authors identified various exemplary teaching practices in relation to design and organization, facilitation, and direct instruction of the course, confirming the importance of the design and implementation issues to LMOOC teaching success (Appel & Pujolà, 2021). As an extension to Luo and Ye s' (2021) finding that the most decisive quality factor across all types of LMOOCs is the effectiveness of teaching content, this study listed some ready-to-use teaching practices for LMOOC educators. For example, in terms of providing clear and precise instruction, it is found that it became effective when difficult content was also provided in one's local languages, similar to what Uchidiuno et al. (2018) proposed. In another example, using roundtable discussion sessions was found to be a good way to identify areas of agreement and disagreement, especially when the topic involves multiple persons with different backgrounds (Shen, 2021) and requires embracement of broad differences in LMOOCs (Mac Lochlainn et al., 2020). This study also identified concrete teaching practices to show how to provide more flexible options in a large-scale LMOOC that take account of learners' linguistic, cultural, psychological and cognitive difference (Read & Barcena, 2021), thus making a direct response to a recent call in LMOOC research regarding the individualization of teaching contents (e.g., Chong et al., 2022; Hsu, 2021a; Jitpaisarnwattana et al., 2021b; Jitpaisarnwattana et al., 2022b; Mac Lochlainn et al., 2021; Martín-Monje et al., 2018; Nie & Hu, 2018). However, at the same time, the authors found little use of innovative activities in teaching presence, such as the use of online games, vocabulary contests, and/or live chat rooms, as proposed by previous LMOOC studies (Friðriksdóttir, 2021a; Hsu, 2021b; Yaşar, 2020; Zhao, 2015).

In the dimension of social presence, although the authors have provided some exemplary practices, it is noteworthy that raters still expressed relatively moderate to low levels of social presence in the observed courses, which is consistent with previous findings that interaction was perceived as hard to achieve through LMOOCs (Barcena et al., 2015; Chong et al., 2022; Jitpaisarnwattana et al., 2021a; Jitpaisarnwattana et al., 2022c; Wright & Furneaux, 2021). This points to a need to create more innovative, or even intelligent communicative tools to aid class interaction and increase the sense of familiarity among learners (Lebedeva, 2021). For example, Uchidiuno et al. (2018) proposed a different matching strategy among LMOOC learners that is not based on time or order, but on abilities recognized by artificial intelligent systems. They also proposed to develop more intelligent systems that can moderate and personalize discussion activities. Another approach would be to encourage a frequent use of personal communication tools to interact with peers outside the LMOOC (Jitpaisarnwattana et al., 2021a), or even allow the link of one's social media account with their MOOC account (Uchidiuno et al., 2018).

In the dimension of cognitive presence, by identifying exemplary practices, the authors were able to explain what the instructor did, what the course provided, or how the course could be improved to foster students' cognitive presence of the course. Notably, we found more exemplary practices existing at the first three stages of cognitive presence, while resolution seems to show limited exemplary practices. It is consistent with the finding of Sadaf et al. (2021) from a systematic review of cognitive presence in online learning that resolution is relatively hard to achieve. This shows that more needs to be done in terms of encouraging students to walk out of their comfort zones and relate the ideas learned in the course to real-world situations (Garrison & Arbaugh, 2007; Jitpaisarnwattana et al., 2022c). Mat Daud et al. (2018) has proposed the adoption of problem-based learning and task-based learning in LMOOCs to encourage students to apply knowledge learned in the course to solve real-world problems. In our identified teaching practices, such endeavor was rarely spotted. Indeed, much of the teaching content in the sampled courses was related to academic writing, which can and should be transferred into learners' real-world academic writing practices. The authors thus advocate for more explicit instruction and design of activity on the application part of the LMOOC content that focuses on using the language in real life scenarios (Krahnke, 1987).

LIMITATIONS

This study has several limitations. First, the selected material for analysis in this study may not include some innovative learning activities. Second, LMOOC learners were constituted of different types (e.g., viewers or all-rounders) (Martín-Monje et al., 2018) and came to class with different learning motivations (Friðriksdóttir, 2021b). It is not clear how such variation may lead to different perceptions of an effective LMOOC course simply based on the findings of this study. Third, the authors selected six courses and four units within each of the six courses to observe. This study's sample size was relatively small, and limited to courses taught in English with a focus on developing academic English skills. As such, it should not be seen as a proxy for all LMOOCs, and the authors call for more replication studies using the developed observation protocol in different LMOOC contexts.

CONCLUSION

LMOOCs provide opportunities for learners to develop language-related skills via the establishment of CoIs. In this study, the authors first developed a CoI observation protocol, COILMC, to observe the existing teaching, social, and cognitive presences in LMOOCs, and tested its reliability using g-theory analysis. The results showed that COILMC is reliable, as evidenced by the large proportion of variance attributed to variation across courses rather than across raters. A follow-up d-study suggested that five and 11 raters were enough to reach moderate and substantial reliability coefficients, respectively. Based on COILMC, we were able to open the “black box” of prior correlational approaches and identified exemplary teaching practices to show exactly how the CoI framework explains what happens in LMOOCs and how educators promoted active interaction, collaboration, and knowledge construction (Palloff & Pratt, 2011). The authors believe that this will help LMOOC educators to better understand the nature of online learning and how to create and maintain CoIs in that context. Additionally, the findings highlighted the value of using observational studies to disentangle the dynamic interchanges that occur in LMOOCs, as a means of providing insights into the findings of traditional correlational studies. The results also show how the different CoI presences may be best observed using somewhat different techniques, which may inform improvements in instructional design and teaching practices. Last but not least, the authors hope that the instructors and designers of LMOOCs will use COILMC to observe, design, and teach LMOOCs in the future.

CONFLICT OF INTEREST

The authors of this publication declare there is no conflict of interest.

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APPENDIX 1

The development of the observation protocol

Round 1: Based on the three standards by Smit et al. (2017), making revisions on Arbaugh et al. 's (2008) instrument.

1.1 All items containing subjective expressions were changed. For example, "Problems posed increased my interest in course issues" was changed to "This course always posed effective questions or problems to increase learning interest."

1.2 Removed two items that was deemed hard to observe, despite the absence of subjective wording. For example, removed "Online or web-based communication is an excellent medium for social interaction," and "I was able to form distinct impressions of some course participants."

1.3 Added expression to maximize transparency. For example, added "clearly," "helpful," "consistently," "precise," "accurate," "timely," "adequate," "always," "throughout," and "strong" to some items.

1.4 Made items more concrete. For example, the item "The instructor helped to focus discussion on relevant issues in a way that helped students to learn" was changed to, "The instructor or teaching assistants provided clear, precise, and accurate instruction to help students to learn";

The item "Getting to know other course participants gave students a sense of belonging in the course" was changed to, "The course provided ample chances for participants to get to know other course participants."

1.5 Merged redundant items. For example, the two items "Always encouraged students to test and apply the knowledge created in this course to other places" and "Enabled students to apply the knowledge created in this course to other work or other non-class activities" were merged into "Always encouraged students to apply the knowledge gained in this course to other settings."

Round 2: Integrating findings from some of the most recent studies involving CoI measurement

2.1 Qualitative findings in general. For example, based on Caskurlu et al.'s (2021) thematic synthesis of the CoI indicators used in 35 published sources, the authors added five items, aimed at capturing data on learning resources, support for interaction, and support for sense of community.

2.2 Findings regarding application of the CoI framework in EFL. For example, based on Yang et al.'s work (2019), we added indicators such as "providing micro-level feedback (spelling, grammatical errors, prepositions, paragraph breaks)" and "providing macro-level feedback (idea, text organization)", to reflect EFL-specific elements of direct instruction.

2.3 Findings about use of the CoI to analyze existing MOOCs. For example, based on qualitative analysis of students' reviews of the characteristics of CoI in successful MOOCs (Cohen & Holstein, 2018), we added one item, "Was helpful in adapting the course for students with different levels of knowledge."

Round 3: Reassign rating scores on a four-point Likert scale

1-point: A given instructional practice was never being used in the course;

2-point: A given instructional practice was being used in the course sporadically;

3-point: A given instructional practice was being used in the course fairly often;

4-point: A given instructional practice was consistently being used in the course.

Round 4: Provided the protocol to 14 EFL instructors for feedback

4.1 Revised ambiguous items that may be interpreted in different ways by different teachers. For example, "Was helpful in identifying areas of agreement and disagreement on course topics," was revised to: "Was helpful in identifying areas of agreement and disagreement (e.g., among students, or about topics)."

4.2 In the affective-expression dimension, we added one item relating to the instructor: "All learning activities enabled students to humanize the instructor as real."

4.3 We added examples under some of the items. For example, below the new affective-expression item about the humanization of the instructor, we added examples including “Incorporates audio and video within the course content,” “Shares personal stories, professional experiences,” “Addresses students by name,” “Shows teacher’s character and personality,” “Exhibits a sense of humor,” and “Uses emoticons”; and beneath the item “Always appreciated different perspectives,” we added examples such as “compares different versions of texts.”

APPENDIX 2

The COILMOC observation protocol

Teaching presence

Design and organization

1. The instructor or the course clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.
5. All course contents and learning materials are aligned to the stated learning goals.

Facilitation

6. The instructor was helpful in identifying areas of agreement and disagreement (e.g., among students, or about topics).
7. The instructor was helpful in guiding the class towards understanding in a way that helped clarify thinking.
8. The instructor was helpful in keeping course participants engaged.
9. The instructor was helpful in acknowledging and encouraging learners’ contributions.
10. The instructor consistently encouraged course participants to explore new concepts in this course.
11. Instructor actions consistently reinforced the development of a sense of community among course participants.
12. The instructor was helpful in adapting the course (e.g., providing different levels of writing tasks, reading materials) for students with different levels of knowledge.
- Direct instruction
13. The instructor or teaching assistants provided clear, precise, and accurate instruction to help students to learn.
14. The instructor or teaching assistants provided clear, precise, and accurate instruction/feedback that helped clarify misunderstandings. This could indicate either of the following feedbacks:
 - a. Providing micro-level feedback (spelling, grammatical errors, prepositions, paragraph breaks).
 - b. Providing macro-level feedback (idea, text organization).
15. The instructor or teaching assistants provided feedback in a timely fashion.
16. The instructor or teaching assistants always supplied additional or clarifying information.

Social presence

Affective expression

17. The course provided ample chances for participants to get to know other course participants.

18. All learning activities enabled students to humanize the instructor as real. Examples:

- a. Incorporates audio and video within the course content
- b. Shares personal stories, professional experiences
- c. Addresses students by name
- d. Shows teachers' character and personality
- e. Exhibits a sense of humour
- f. Uses emoticons

19. All learning activities enabled students to humanize peers as real. Examples:

- a. Creates a 'meet your classmates' section
- b. Encourages students to share experience and beliefs
- c. Uses emoticons

Open communication

- 20. The instructor provided adequate chances for students to converse through the online medium.
- 21. A feeling of comfort could always be drawn throughout the course discussions.
- 22. The instructor always encouraged students to express themselves.

Group cohesion

- 23. Even showing disagreement, the course still maintains a strong sense of trust.
- 24. Students' point of view was always acknowledged by other course participants.
- 25. Collaboration among participations was always encouraged throughout the course.

COGNITIVE PRESENCE

Triggering event

- 26. This course always posed effective questions or problems to increase learning interest.
- 27. Course content or activities piqued learning curiosity.
- 28. The course consistently took students' previous learning into account when introducing new knowledge.

Exploration

- 29. The course provided adequate diverse information sources/activities for students to explore authentic settings.
- 30. Brainstorming and finding relevant information helped me resolve content related questions. (Examples: Revisit what students had learned in offline classes, seek supplementary resources, etc.)
- 31. The course always appreciate different perspectives. (Compares different versions of texts)

Integration

- 32. The course effectively integrated new information to help answer questions raised in course activities.
- 33. Learning activities are helpful for students to construct explanations/solutions.
- 34. The course provided adequate opportunities for reflection on course content and discussions.

Resolution

- 35. The course always encouraged students to apply the knowledge gained in this course to authentic settings
- 36. The course developed effective solutions to course problems that can be applied in practice.

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