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Research Article

Seeking the optimal SPOC-based blended learning approach to enhance deep learning from the community of inquiry perspective

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ABSTRACT

To equip students with 21st century skills to be competent global citizens and succeed academically and professionally, information and communication technology tools are being utilized to facilitate deep learning in higher education. This study integrated a small private online course (SPOC) with face-to-face (F2F) classroom learning to design and implement a blended English as a foreign language (EFL) course for deep learning. A mixed-method design was employed to investigate the learning experiences and perceptions of EFL students in the SPOC-based blended learning (BL) environment. The primary objective was to examine whether and how the teaching, social and cognitive presences were established from the perspective of the community of inquiry (CoI) model. Participants were 60 students enrolled in an eight-week English communicative course in a Chinese college. Quantitative data was obtained from the CoI and BL surveys, while qualitative data was gathered through individual interviews with 10 students. The results showed that a CoI was established, and deep learning happened in both SPOC and F2F learning areas with a more salient teaching presence in the SPOC area, a stronger social presence and a higher frequency of resolution phase reached in the F2F area. Furthermore, learners expressed satisfaction with the BL course, perceiving it as effective for English language acquisition. Pedagogical implications were offered to assist educators and institutions in optimizing the use of SPOC-based BL to enhance deep learning.

Keywords: SPOC, deep learning, blended learning, EFL learning, community of inquiry

INTRODUCTION

Information and communication technology (ICT) is playing an increasingly important role in educational reform and development. With the continuous integration of ICT and education, deep learning is regarded as the main goal and appeal of higher education (Filius et al., 2018b) in which learners not only achieve greater learning outcomes (Chen et al., 2010) but also their 21st century skills, particularly critical thinking, problem-solving, and creativity (Barell et al., 2010).

According to Garrison and Kanuka (2004), ICT has transformative potential for higher education. ICT tools have provided learners with an innovative learning environment with easy access to rich online resources and multiple ways of interaction (Fu, 2013). However, these ways of learning may also inhibit deep learning of students and result in surface learning or entertainment only. For example, learners may quickly get immediate satisfaction from fast-food-style reading (Li, 2020) and multitask in various ways of communication

(Junco & Cotten, 2012). Therefore, educators have the responsibility to ensure that students use ICT tools to have deep learning experiences.

Interaction, collaboration, and a sense of community are considered to be indispensable to achieving deep learning outcomes (Ertmer et al., 2007; Filius et al., 2018a). Although the sense of community may be easily developed in face-to-face (F2F) class (Garrison & Cleveland-Innes, 2005), the collaboration and interaction between students and between students and teachers are confined because of time limitations, big-sized classes (Garrison & Vaughan, 2008) and teacher-centered pedagogical approaches (Freeman et al., 2014). Therefore, deep learning and high-level thinking activities rarely happen in traditional classrooms. As a careful integration of F2F instruction with ICT-mediated instruction (Graham, 2006), blended learning (BL) is proven to produce positive pedagogical outcomes (López-Pérez et al., 2011) and has the potential to support deep learning (Garrison & Kanuka, 2004; Vaughan & Garrison, 2005).

According to Garrison and Kanuka (2004), "what makes BL particularly effective is its ability to facilitate a community of inquiry (CoI)". Thus, the process of carrying out a successful BL can be regarded as the one in which a CoI is created, preserved, and advanced. Therefore, there is a need for researchers and teachers to make the best use of the blend to support a CoI for high-level learning experiences. Small private online courses (SPOCs) naturally blend the benefits of conventional F2F classroom teaching with the resources of massive open online courses (MOOCs) (Fox, 2013). However, it was found that there were challenges when employing online learning in SPOCs to promote deep learning (Filius et al., 2018b). In previous studies, SPOCs were frequently integrated with F2F classroom instruction to design and carry out BL and teaching in multiple disciplines (Jia & Zhang, 2021; Xue & Dunham, 2021; Zhang et al., 2019). The majority of the research focuses on the effect of the SPOC-based blended approach on learners' learning outcomes, but a few focus on deep learning. To the best knowledge of the authors, no study has been conducted to comprehend how deep learning happens in a SPOC-based blended environment for EFL learning based on the framework of CoI. Moreover, little has been done to explore the role of both SPOC and F2F classroom learning for deep learning in EFL education.

The present study designed and implemented a SPOC-based blended English as a foreign language (EFL) course in a large college in China. The online SPOC learning, including autonomous learning and discussion activities, was integrated with F2F classroom interactive and communicative activities aiming for deep learning. A convergent mixed method was employed to investigate how deep learning happened and students' learning experiences in the designed SPOC-based BL environment from the perspective of the CoI framework. Therefore, this study can provide educators and instructional designers valuable insight and pedagogical guidance on how SPOC-based BL can optimally integrate online and F2F learning to promote deep learning. The research questions are, as follows:

1. What are the students' perceptions of teaching presence, social presence, and cognitive presence in SPOC-based BL?
2. What are the students' satisfaction and perceived effectiveness of the SPOC-based BL?
3. How did SPOC-based online learning and F2F learning contribute to deep learning?
4. How did the CoI presences manifest in a SPOC-based BL environment?

LITERATURE REVIEW

EFL Learning in China

Since China adopted its reform and open-up policy in 1978, the exchanges and cooperation between China and other countries are in nearly every industry (Wang & Woo, 2007). With the acceleration of globalization, the English language has become a lingua franca all over the world (Jenkins, 2019). Consequently, there was a huge demand for graduates with high foreign language proficiency especially English to do foreign affairs and exchange internationally. Learning English becomes a national fever (Wang, 2009), and teachers and scholars have been striving for improving the quality of English language education in China (Cheng & Wang, 2012; Su, 2021).

However, due to traditional cultural norms, examination-oriented education, and EFL contextual constraints, the traditional ways of teaching foreign languages were prevalent in China (Wei et al., 2018). Thus, great importance was attached to language form and accuracy, and learners learned English mainly by rote and memorization, repeated drills, grammar analysis and explanation (Wei et al., 2018). As a result, these English classes led to superficial learning, poor efficiency, a lack of practical application ability and high-order thinking skills (Wei et al., 2018).

To be a competent global citizen, one should not only have communication skills (Davitishvili, 2017) but also other 21st century skills including critical thinking, creativity, and collaboration (Erdoğan, 2019). Only by being equipped with those 4C skills can learners thrive academically and professionally in the future (Pardede, 2020). However, the traditional ways of teaching and learning English fail to prepare students for a constantly evolving global and technological world, and there has been a pressing need for a pedagogical shift from the traditional methods.

Deep Learning

According to studies conducted in the last few decades on learning approaches, two major methods of learning that students use are surface learning and deep learning (Filius et al., 2018a). A surface learning approach is characterized by little involvement with the task, a tendency to concentrate on memorizing without reflection, and frequently the goal of examinations (Smith & Colby, 2007). A deep learning approach, on the other hand, entails an attempt to comprehend and establish meaning. In this instance, the learner concentrates on the connections between different material elements, develops theories or opinions regarding problems or concepts, and links more to developing an innate interest in knowledge acquisition and comprehension (Smith & Colby, 2007). It is believed that surface learning leads to shallow comprehension, short-term memory retention, and limited application of knowledge, whereas deep learning fosters long-term retention, knowledge transferring, deeper understanding of the material and critical thinking skills (Marton & Saljo, 1976; Ramsden, 1991; Trigwell & Prosser, 1991).

Based on Bloom's revised taxonomy (Krathwohl, 2002), surface learning may be sufficient for the lowest educational objectives: remembering and understanding. To achieve higher levels of learning objectives including applying, analyzing, evaluating and creating, deep learning guarantees a solid foundation. According to Anderson and Krathwohl (2001), mastering lower-order thinking skills is essential for achieving higher-order thinking, implying that memory and comprehension in surface learning are necessary foundations for deep learning. Therefore, Bloom's revised taxonomy can guide the setting of hierarchical cognitive goals for education. Accordingly, learning activities can be organized from lower to deeper levels. As a result, the learners' lower-order and higher-order cognitive skills can be developed.

Community of Inquiry Framework

To achieve deep learning outcomes, teachers can influence the learning approach by changing the learning context through pedagogical approaches, assessment methods, and curriculum designs (Filius et al., 2018a). To design an effective learning context, the CoI framework (Garrison et al.,1999) can be a conceptual framework for developing online and BL (Cleveland-Innes, 2019). Moreover, the CoI framework can also serve as the basis for evaluating and analyzing the learning process (Akyol & Garrison, 2008; Garrison & Arbaugh, 2007; Yang et al., 2016). Therefore, applying the CoI framework over time has inspired educators to integrate CoI concepts into their educational experiences (Garrison, 2017).

The foundation of the CoI framework is the notion that community building is essential to successful learning (Swan et al., 2009). Furthermore, to achieve higher-order cognitive learning, the community needs to be built on a cognitive and social level (Garrison & Kanuka, 2004). A teaching level is also necessary to maintain control over the learning environment and steer the learning process in the right direction (Filius et al., 2018a). According to Garrison and Kanuka (2004), deep learning can occur only when cognitive presence, teaching presence and social presence interact.

Cognitive presence refers to the degree to which learners can construct and verify meaning through sustained reflection and discourse in a CoI (Garrison et al., 2001). It is operationally defined by the practical inquiry model (PIM) (Swan & Richardson, 2009). The triggering event and exploration are considered lower levels of thinking skills, while the integration and resolution phases belong to higher levels. Previous studies

indicated that the students' inquiry process usually stagnated in the exploration phase and seldom moved beyond that phase (Garrison & Arbaugh, 2007; Kilis & Yildirim, 2019). However, it can move forward to the integration and resolution phases with appropriate tasks or questions (Galikyan & Admiraal, 2019; Gašević et al., 2015) and explicit instructions from teaching presence (Garrison & Arbaugh, 2007).

Social presence is the extent to which an individual is regarded as real in mediated communication (Gunawardena & Zittle, 1997) and the ability to participate as a member of the learning community and to have open, courteous, and trusting discussions (Kaczkó & Ostendorf, 2023). Three categories of social presence, affective responses, interactive responses, and cohesive responses were identified and renamed by Rourke (2001). Previous research revealed that social presence directly influenced cognitive presence development and partially mediated the relationship between teaching and cognitive presence (Mutezo & Maré, 2023; Redstone et al., 2018). Social presence is essential to enhance learning effectiveness in both traditional and online settings (Marcus, 2006).

Teaching presence is "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson et al., 2001, p. 5). Teaching presence is divided into three categories: instructional design and organization, facilitating discourse and direct instruction (Anderson et al., 2001). The teaching presence can directly influence learners' cognitive and social presence and indirectly influence their academic achievement (Law et al., 2019). Therefore, for a CoI to be established and sustained, a deliberate, intentional, and attentive teaching presence is crucial (Garrison & Cleveland-Innes, 2005).

With the popularization of the CoI framework in online and BL (Garrison, 2015), some new presences were proposed such as autonomy presence (Lam, 2015), learning presence (Shea & Bidjerano, 2010) and emotional presence (Stenbom et al., 2016). However, Garrison (2015) argued that while attempting to add or remove any components from the CoI framework, "care must be taken to preserve its integrity and parsimony" (p. 31). It is argued that adding new presences to the original CoI presences is either unnecessary or damaging to the community's dynamic nature (Kozan & Caskurlu, 2018). Therefore, to maintain a cohesive framework with the CoI survey, all codes from the interviews were categorized under the classic CoI presences in this study.

SPOC-Based EFL Learning and Deep Learning

Much empirical research agree that using ICT in conjunction with effective instructional practices can boost deep learning (le Roux & Nagel, 2018; Pegrum et al., 2015). With the widespread use of ICT in language learning, increasing focus is being given to the enabling effects of these tools on deep learning in language teaching and learning (Jiang, 2022; Tochon et al., 2014). Deep learning is receiving growing attention in the Chinese EFL field with an emphasis on higher-order thinking skills, which are typically lacking in traditional EFL classrooms (Dai & Sihes, 2023).

Du and Qian (2022) utilized MOOCs in a flipped classroom to facilitate deep learning in English grammar classes. The result indicated that this model could give learners a profound learning experience with an immersive, personalized and interactive environment. Learners' deep learning abilities, such as their capacities for communication and transferring, can be improved by facilitating online interactions, classroom discussions, and simulation activities. Yang et al. (2013) used Moodle to develop a BL environment for English speaking and listening learning by providing an authentic learning environment and content, promoting learner-centered strategies and offering appropriate scaffolding to foster EFL learners' English communication skills and critical thinking skills.

As a form of online education that has a smaller size of students and higher completion rates than MOOC (Armando Fox, 2013; Filius et al., 2018a), SPOC-based learning has become a main learning mode in Chinese higher institutions during the COVID-19 pandemic period (Xu et al., 2020). However, when promoting deep learning in SPOCs, it was found that due to the lack of F2F interactions, several challenges were raised, including difficulty in stimulating social cohesion, inflexibility in adapting teaching strategies to adjust to learners' needs, shortage of insight to learners' needs and tendency to prompt surface learning (Filius et al., 2018a). Therefore, BL appears to be the solution for promoting deep learning since it can provide F2F interaction opportunities and foster a CoI where deep learning happens (Garrison & Kanuka, 2004).

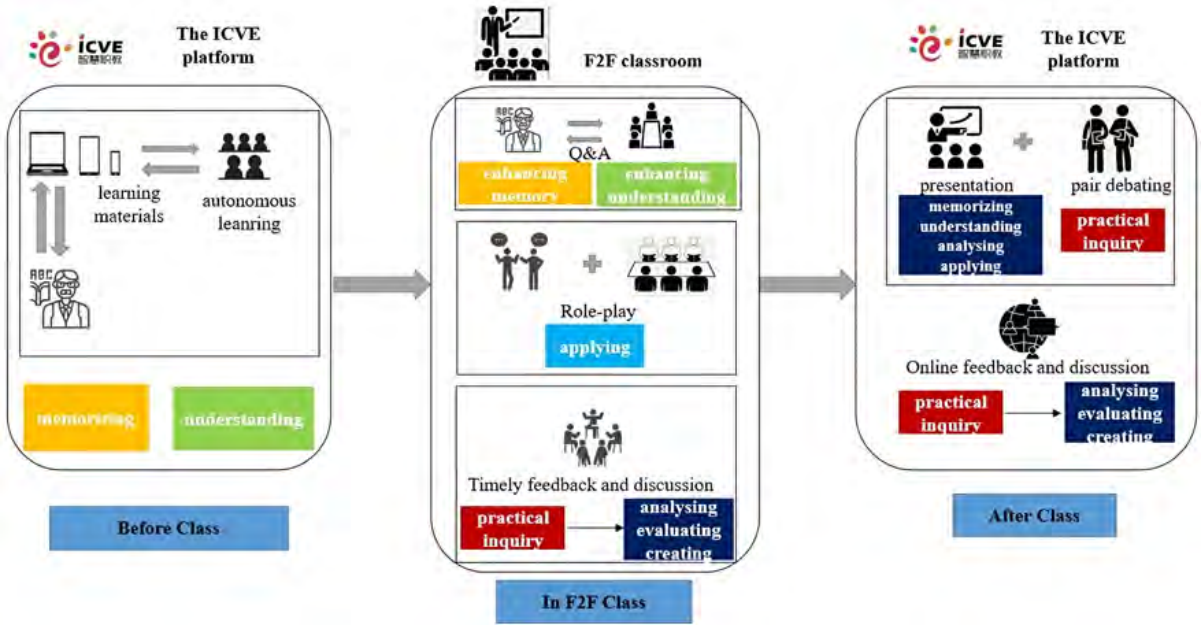

Figure 1. The procedure of the SPOC-based blended learning for deep learning (Source: Authors)

Although some studies are exploring the SPOC-based blended approach in the fields of EFL education (e.g., Wen & Li, 2021; Wu, 2017), there have been few empirical studies to explore how SPOC-based BL can enhance deep learning in EFL learning. Therefore, this study intends to design and implement a SPOC-based BL approach for deep learning among Chinese EFL learners and investigate whether and how it could support EFL learning as well as learners' perceptions and experiences.

With the development of ICT tools, more research is needed to explore the capacities and challenges of integrating different ICT tools to promote deep learning (Liesa-Orús et al., 2020). This study is in this direction. With this in mind, it explored how to integrate F2F, and SPOC learning wisely and well and use both of them best for deep learning in EFL education. In addition, various disciplinary studies have attested to the usefulness of ICT tools in creating communities of inquiry in online learning environments (e.g., Annamalai et al., 2024; Wang et al., 2016). However, it has not been thoroughly studied in BL settings, and even less so in SPOC-based BL where its application in English language learning is limited. This research seeks to advance knowledge of CoI in the BL environment through the design and application of the SPOC-based blended EFL learning course in a Chinese college.

Design the SPOC-Based BL for Deep Learning

The study was performed in a first-year oral English course at a large college in southeastern China. Sixty enrolled students were chosen for the campus-based course, which lasted eight weeks and was facilitated and managed by a senior EFL lecturer. The college encourages BL, with instructors integrating regular F2F classroom instruction with online learning on the Intelligent Center of Vocational Education (ICVE), the SPOC platform used at the college.

Figure 1 illustrates the design of SPOC-based BL procedures under the CoI framework's guidance to develop different cognitive skill levels in revised Bloom's taxonomy. One week before the F2F class, the learning materials, including short teaching videos, teaching slides, student demonstration videos, and real-life situational ones, were uploaded to ensure that learners had sufficient time to conduct self-learning. The teaching slides covered frequently used situational phrases, sentences, and demonstration dialogues. In the teaching videos, the instructors explained the linguistic points of the learning materials in the slides. Thus, in autonomous learning, learners mainly employ surface learning to remember the language form and understand the situational materials, which could lay the foundation for high-level learning afterwards. Meanwhile, learners may encounter problems and explore the answers in autonomous learning.

The F2F classroom learning started with questioning and answering activities to check students' self-learning outcomes in the SPOC platform and reinforce their memory and comprehension. Then, role-play

activities were carried out in groups or pairs to apply what they had learned. After the role-play performance, timely feedback and discussion from peers and the teacher were given. As the initial point of practical inquiry, problems were identified as initial points of inquiry by analyzing and evaluating others' performance. Then, various opinions and critiques promoted deeper exploration and comprehension of the subject. The inconsistencies of viewpoints or knowledge gaps could encourage further thought and concept integration. Finally, learners might revise or recreate their oral performance by drawing lessons from feedback activities.

With visual signals in F2F classrooms, teachers and students could communicate directly, resulting in immediate feedback, timely modifications to instructional strategies, and more dynamic discussions. Moreover, direct and immediate verbal and non-verbal interactions could establish a sense of belonging and group cohesion. However, due to the big class size and limited class time, it was hard to guarantee that each student had enough time and opportunities to fully engage in those classroom activities.

After the F2F classroom instructions, students were given one week to finish the oral assignments, including self-presentation and pair discussion. They completed these tasks individually, collaborated with their peers, and then submitted the recordings to the ICVE platform. To complete the presentation tasks, students should understand the topics, recall the previous information, and apply their knowledge after analyzing different facets of the topics. In the pair discussion tasks, two exchanged initial ideas on a subject, pinpointed essential problems, and came up with questions to delve deeper into. They then debated different viewpoints and challenged one another's opinions. Next, pairs synthesized their findings by fusing different bits of knowledge to create a logical conclusion. After submitting the oral recordings, each of the six students and the teacher formed one group to provide feedback on the recordings on the discussion forum of the ICVE platform through asynchronous written communication.

Without the constraints on time and space, students could have sufficient time and chances to engage in the inquiry process online. Moreover, learners are generally more critical and thoughtful when participating in online discussions compared with F2F ones (Wang & Woo, 2007). Online discussions result in in-depth discussions even though it is more challenging for students to reach a consensus (Walther, 1996). Teachers' responsibilities in the online discussion forum included creating a conducive learning environment for inquiry and promoting and sustaining student engagement and online interaction. Meanwhile, online interaction helped to maintain and strengthen the social presence.

RESEARCH METHODOLOGY

This research employed a convergent mixed-method case study to explore how the SPOC-based BL designed in this study contributes to EFL learning and what learners' perception of it is. The rationale behind selecting a case study method is its ability to examine the in-depth data (Heale & Twycross, 2018) and obtain a complete understanding and holistic nature of the phenomenon in a natural context (Johansson, 2007; Sandelowski, 1996). After the intervention, the CoI survey and BL survey were used to collect quantitative data. Meanwhile, individual interviews were utilized to collect qualitative data. The quantitative and qualitative data were collected and analyzed separately. Then, the findings were merged by comparing and contrasting to provide comprehensive and in-depth insights into how the SPOC-based BL approach worked for deep learning and the learners' perceived learning experience of it.

Convenience sampling was employed to select 60 non-English major freshmen aged 18-20 years (10 males and 50 females) from two intact classes in a southeastern Chinese college. Based on the curriculum plan, all first-year students should take the compulsory "basic communicative English" course. An EFL teacher with more than ten years of teaching experience taught the class and was informed of the design of this study.

The Chinese version of the CoI survey instrument (Ma et al., 2017) based on the original one (Arbaugh et al., 2008) was adopted in this study to quantify the learners' perceived levels of social presence, teaching presence, and cognitive presence and offer insights into how they enhance the SPOC-based BL experience. The CoI survey comprised 34 items with a 5-point Likert scale, each representing a category and an indicator. The instrument's overall Cronbach's alpha of 0.934 was reported, which indicates highly reliable (Meyers et al., 2013).

Table 1. Descriptive statistics of EFL learners' CoI presences

Presence	Items	N	Mean	Standard deviation
Teaching	13	60	4.53	0.64
Social	9	60	4.39	0.81
Cognitive	12	60	4.35	0.83

The BL survey instrument was modified from the blended course student survey suggested by the University of Central Florida (UCF) and the American Association of State Colleges and Universities (AASCU) (UCF & AASCU, 2017) to gather self-reported quantitative data from EFL learners about their feedback regarding the BL experience. It contains four dimensions with 12 five-point Likert-scaled items: overall satisfaction of BL, the effectiveness of BL, satisfaction of F2F classroom learning and SPOC learning. The Cronbach's alpha score for the questionnaire is 0.947, indicating high reliability.

Individual interviews were conducted with the EFL learners to better understand the roles of SPOC and F2F learning. The research questions served as a basis for creating the interview questions. In the end, ten student participants–designated as S01-S10–were chosen voluntarily to reach the data saturation. Although the interview questions were written in English, the interviews were performed in Chinese due to the limited English proficiency of EFL learners. The interview data was collected, transcribed, and translated from Chinese into English for analysis.

Before the teaching intervention, the teacher briefly introduced the objectives, protocols, data confidentiality, and voluntary participation to the students, followed by collecting consent forms from the student participants. After the teacher explained the use of the ICVE platform to the students, the SPOC-based blended approach was implemented in the class for six weeks covering two modules of the course "basic communicative English". After the experiment, the CoI questionnaire and BL survey were conducted to investigate learners' feedback and learning experience of BL. Finally, ten participants were randomly selected for individual interviews to analyze the contributions of SPOC and F2F instructions for deep learning.

Quantitatively, descriptive statistical analysis was used to analyze the data from both questionnaires. Qualitatively, thematic analysis was performed following the six steps proposed by Braun and Clarke (2006): familiarizing the data, generating codes, constructing themes, reviewing themes, defining and naming themes, and producing the report. Subsequently, two coders identified the different themes of students' perceptions of online SPOC learning and F2F learning inductively. The two coders have an agreement rate of above 90%. One of the coders then used the CoI framework to guide the deductive recoding of themes of online SPOC learning and F2F learning, respectively, organizing codes into social presence, teaching presence, and cognitive presence.

RESULTS

RQ1. What Are the Students' Perceptions of Teaching Presence, Social Presence, and Cognitive Presence in SPOC-Based BL?

All 60 of the CoI survey questionnaires were valid, and the response rate was 100%. I applied Cronbach's alpha in SPSS to calculate the reliability of this CoI questionnaire. The results indicate that the questionnaire was highly reliable ($\alpha = 0.977$).

Table 1 shows the descriptive statistical results of the students' perceived levels of CoI presences in the SPOC-based BL environment. The mean scores for teaching, social, and cognitive presences were 4.53, 4.39, and 4.35, respectively, with the teaching presence scoring the highest. The findings reveal that learners experienced high levels of CoI presences, and a CoI has been established in the SPOC-based BL environment. Learners are generally satisfied with this BL environment, especially the teaching.

Table 2 illustrates that the mean scores of categories under each CoI presence are greater than 4.0. The high scores of teaching, social, and cognitive presences indicate learners' strong approval of course structure, planning, and teaching practices that create a supportive and interactive BL environment; eventually, high-level cognitive activities that are deep learning have taken place in the designed SPOC-based BL environment.

Table 2. Descriptive statistics of CoI-presence constructs

Presence	Constructs	Mean	Standard deviation
Teaching	Design & organization	4.65	0.54
	Facilitation	4.48	0.71
	Direct Instruction	4.54	0.66
Social	Affective responses	4.50	0.69
	Interactive responses	4.34	0.90
	Cohesive responses	4.33	0.85
Cognitive	Triggering events	4.31	0.86
	Exploration	4.45	0.72
	Integration	4.36	0.78
	Resolution	4.26	0.96

Table 3. Descriptive statistical data of student perception of blended course

Learning experience	N	Mean	Standard deviation
Overall satisfaction	60	4.36	0.810
Effectiveness of BL	60	4.35	0.686
Satisfaction with SPOC learning	60	4.26	0.584
Effectiveness of SPOC learning	60	4.29	0.683
Satisfaction with F2F learning	60	4.38	0.596
Effectiveness of F2F learning	60	4.45	0.628

RQ2. What Are the Students' Satisfaction and Perceived Effectiveness of the SPOC-Based BL?

After the teaching intervention, all sixty students returned the blended course questionnaires. Before conducting the descriptive analysis, SPSS 27 was used to determine the reliability of the blended course questionnaire. The findings demonstrate the high reliability of the questionnaire ($\alpha = 0.949$).

Table 3 presents the mean scores and standard deviations (SDs) for the six categories in the blended course survey. With a mean score of 4.36 (SD = 0.810), the survey findings show that participants were generally satisfied with the blended course. Additionally, learners stated that the BL approach was highly effective (mean [M] = 4.35, SD = 0.686). Upon analyzing elements of the BL setting, students conveyed contentment with their SPOC learning (M = 4.26, SD = 0.584) and F2F classroom learning (M = 4.38, SD = 0.596). SPOC online learning (M = 4.29, SD = 0.683) and F2F classroom learning (M = 4.45, SD = 0.628) also received high effectiveness ratings.

According to these results, students highly valued all aspects of the BL environment. They believed both SPOC and F2F classroom learning were beneficial and effective for EFL learning. In addition, the F2F learning received higher satisfaction and perceived effectiveness over SPOC-based online learning.

RQ3. How Did SPOC-Based Online Learning and F2F Learning Contribute to EFL Learning?

Based on the individual interview data, thematic analysis was employed to identify themes in SPOC-based online learning and F2F classroom learning. Then, under the framework of CoI, those themes were recoded deductively. We indicate the perceived roles of SPOC-based learning and F2F classroom learning and the frequency of codes under each theme.

As indicated in **Table 4**, the most prominent theme relating to SPOC-based learning was direction instruction of teaching presence, which was mentioned 29 times as related to enhancing understanding and gaining knowledge. For example, one student reported, "I can preview and review the learning materials, which makes the knowledge easy to understand and grasp" [S07]. As for the design and organization, learners reported 22 times relating to the benefits of autonomous learning conducive to EFL learning. One student interviewee stated, "The ICVE platform's learning materials are rich and lively" [S05]. Furthermore, students stated that the teacher had facilitated online discussions (frequency: 6). One student said, "The teacher often encourages us to participate in online discussions" [S02].

In terms of cognitive presence in the SPOC learning area, it was seen that inquiry, integration, and resolution were all present. This suggests that collaborative learning occurred, and most learners engaged in the exploration stage (frequency: 28). One student mentioned: "I can review the content on the platform

Table 4. Qualitative analysis of interviews on SPOC-based online learning

Themes	Codes	Number of codes
Enhancing understanding and gaining knowledge (teaching presence: direct instruction)	Total	29
	Helped knowledge consolidation	11
	Helped deep understanding and master knowledge	10
	Helped identify and fill the knowledge gap	8
Benefits of autonomous learning for EFL learning (teaching presence: design & organization)	Total	22
	Rich learning materials, more interesting than textbooks	7
	Helped enhance course progression	6
	Highlighted the key points	5
	Videos easier to understand than lectures	4
Teaching presence: Facilitation	Encouraged to engage in discussion	7
Social presence: Interactive and cohesive responses	Interaction with the teacher and peers out of class	8
Collaborative and autonomous learning for improvement (cognitive presence: exploration)	Total	28
	Helped identifying problems	9
	Discussed and learned from each other	5
	Autonomous learning and learning anytime	14
Cognitive presence: Integration	Repetitive learning in one's own time	12
Cognitive presence: Resolution	Corrected the errors	4

repeatedly until I fully understand and master" [S06]. Moreover, some groups engaged in the stages of deep learning which are integration (frequency: 12) and resolution (frequency: 4). One learner reported, "The feedback from peers and the teacher helped me to identify my errors and problems in English speaking" [S04]. "Based on the feedback, I can correct the mistakes accordingly", [S01] said another participant.

Regarding social presence, student interviewees considered that SPOC-based learning provided them opportunities for interacting with the teacher and other classmates outside the classroom (frequency:8), implying that social presence was initially established in the online learning environment. One student interviewee said, "The ICVE platform gives us opportunities to communicate with the class outside the classroom" [S05].

Table 5 illustrates the perceived roles of F2F classroom learning and the frequency of each code under the framework of CoI. The interviewees reported social presence 35 times, which indicated that F2F classroom learning contributed much to establishing a sense of belonging and community. One student said, "Classroom learning allows us to interact with the teacher more directly" [S03]. Another one mentioned, "I appreciate the opportunities to collaborate with classmates during our classroom sessions" [S08]. One student participant stated, "Discussion and collaboration with others make the learning process more engaging" [S05].

The teaching presence was also prominent. It was mentioned 17 times about obtaining guidance from the teacher and 10 times regarding the benefits of F2F oral activities for EFL learning, including getting immediate feedback from the teacher, consolidating knowledge and improving oral skills. For example, one interviewee mentioned, "The instant feedback from our teacher helps me understand where I need to improve" [S10]. Another learner said, "I can ask the teacher immediately when I have problems" [S02]. The oral activities helped learners enhance oral skills (frequency: 7) and reinforce their knowledge (frequency: 3). "Oral activities help me a lot in enhancing my oral English ability" [S09], stated another participant.

The interviewees reported 41 times of cognitive presence with the different phases of practical inquiry: 15 times exploration and 26 times of deep learning states (11 times integration and 15 times resolution). Some reported, "Discussion activity helped me to discover my problems" [S01]. One student said, "I have learned a lot of new expressions when listening to other students' performances" [S07]. Another stated, "In the role-play activities, I can use the sentences learned online" [S06]. This implies that F2F classroom instruction provides learners with collaboration and deep learning opportunities. As a result, most students completed the circle of PIM.

RQ4. How Did the CoI Presences Manifest in the SPOC-Based BL Environment?

Based on themes identified in the interviews, the classic CoI is closely aligned with the codes that emerged in the SPOC-based learning environment. **Figure 2** illustrates the original CoI presences in red dotted lines,

Table 5. Qualitative analysis of interviews on F2F classroom learning

Themes	Codes	Number of codes
Obtaining guidance from the teacher (teaching presence: direct Instruction)	Total	17
	Timely feedback from the teacher	8
	Inquired teacher when having problems	9
Oral activities related benefits (teaching presence: design& organization)	Total	10
	Improved oral skills	7
	Consolidated what learned online	3
Benefits of group and peer work (cognitive presence: exploration, integration and resolution)		41
Cognitive presence: Exploration	Total	15
	Helped identified problems	9
	Discussed and collaborated with peers	6
Cognitive presence: Integration	Total	11
	Learned from other students	6
	Enriched own oral expressions	5
Cognitive presence: Resolution	Total	15
	Applied what learned online	9
	Corrected errors immediately	6
Interactive learning and peer dialogue (social presence: interactive and cohesive responses)	Total	27
	Interaction with the teacher and students	19
	Practice dialogues with peers	8
Increased engagement and motivation (social presence: affective responses)	Total	8
	Facilitated learning interest	5
	Enhanced learning motivation	3

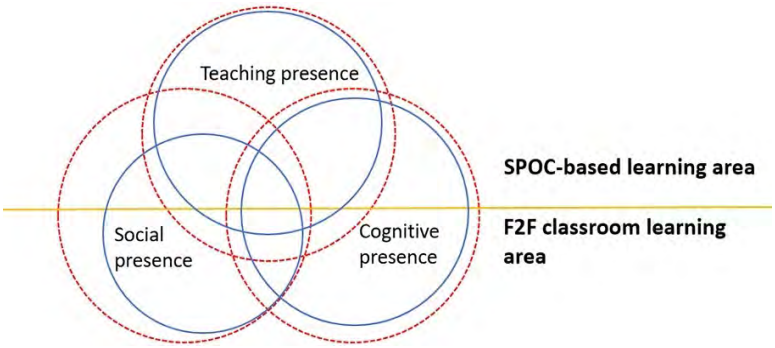

Figure 2. CoI presence distribution in the SPOC-based BL (blue complete lines) in comparison to the classic CoI (red dotted lines) (Source: Authors)

while the presences emerged in this study in blue complete circles within SPOC-based online learning and F2F classroom learning areas. Although all three presences were present in both learning areas, they were unevenly distributed. The two colors of circles' varying diameters point to places that need improvement.

Teaching presence was present in both learning areas, with a much more prominent place in the SPOC-based learning space. Social presence was much more present in the F2F classroom compared to the SPOC online learning area. Cognitive presence was well established in the BL environment, with more exploration in the SPOC learning area. In addition, the phases of integration and resolution were reached in both learning areas, implying the completion of the practical inquiry process and resulting in high-order learning.

DISCUSSION

This study proposed a SPOC-based blended EFL learning approach for deep learning and investigated learners' perceptions of SPOC-based online learning, F2F classroom learning, and BL as a whole. The results implied that EFL learners considered that an inquiry community was established in the SPOC-based BL environment. Deep learning took place in online learning and F2F classroom learning areas. In addition, learners were delighted with this BL approach. It was believed that both online SPOC and F2F classroom

learning were conducive to their EFL learning, although they made different contributions. The findings align with previous studies that state that the CoI model can be a pedagogical framework to guide the design of BL for deep learning (Zhang, 2020).

With the highest score in the CoI survey, teaching presence is also the most salient theme in the interviews. This is most likely because learners believed that the guidance and scaffolding from the teacher were very effective and essential for their learning. In terms of design and organization, the teacher provided easy-to-understand, lively and focused learning content on the SPOC. The favorable feedback from students about their interactions with instructors in the study is consistent with the CoI model's criteria for effective teaching presence (Annamalai et al., 2024). Furthermore, Singh and Richards (2006) argue that teaching should help learners comprehend the values and assumptions embedded in the materials utilized in pedagogical practices.

The well-defined learning objectives and organized learning activities helped the learners reinforce their knowledge and allowed them to use English, thus facilitating their oral English skills. Regarding direct facilitation, the learners value the teacher's role in providing timely feedback and promptly responding to their inquiries in the F2F classroom instruction to assist them in overcoming learning difficulties and problems. In addition, the scaffolding from the teacher in the SPOC learning helped them understand, master and consolidate the knowledge. In addition, the teacher also played a crucial role in facilitating the discussion. This corresponds with the previous assumption that teaching presence is critical in the learning community and can help enhance learners' learning experience and effectiveness (Szeto, 2015) by facilitating social and cognitive presences (Garrison & Arbaugh, 2007; Wang et al., 2016).

The results from the CoI survey and interviews indicate that social presence is well established in the SPOC-based BL environment, especially in the F2F classroom learning area. This is likely because the learning activities entail learners interacting with their peers and teachers online and offline. A much higher level of social presence was found in the F2F classroom learning area compared to the low level of interactivity in asynchronous written-text discussions in the SPOC. This aligns with earlier research findings that F2F social presence can be much easier established than in an online asynchronous communicative environment with non-verbal cues, immediate feedback and directional contact (Bowers & Kumar, 2015; Meyer, 2003). Another factor contributing to the establishment of social presence is the collaborative and positive learning environment afforded by the role-play and discussion activities in the F2F classroom which not only stimulate students' learning motivation but also makes the learning process more interesting.

In terms of cognitive presence, after integrating, comparing, and contrasting the qualitative and quantitative data, the findings indicated that most of the students achieve cognitive presence at a deeper level, implying that high-level learning happened in both learning areas. This is probably due to the design of an effective learning context for deep learning which corresponds with the assumption that appropriate tasks, learning activities and scaffolding can help learners reach the phases of deep learning (Galikyan & Admiraal, 2019; Garrison & Arbaugh, 2007). In the SPOC learning area, most of the learners were involved in the phase of exploration and integration, but only a few reached the level of resolution. This may be because of the nature of the autonomous learning and discussion activities, which neither requires learners to test or apply those learned. Additionally, a lack of immediate feedback and structured guidance in an asynchronous discussion can hinder learners from moving forward to the resolution phase (Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2006). However, in F2F classroom settings, students can immediately ask questions and receive instant and tailored feedback (Dvoráková et al., 2021; Gilboy et al., 2015), then correct their errors and misunderstandings and overcome challenges. Moreover, the role-play activities entail learners applying the knowledge learned to practical use. Therefore, more students reported higher levels of learning especially the resolution phase in the F2F classroom area.

The BL student survey results show that learners were highly satisfied with the SPOC-based BL course and considered it quite beneficial and effective for EFL learning. These findings triangulate the results from the CoI survey that the CoI has been established where learners can engage in deep learning, feel a strong sense of community and belonging, and get constructive feedback and scaffolding. Deep learning happens in this interactive, collaborative and engaging environment, and consequently, positive learning outcomes are achieved (Filius et al., 2018a). Although F2F classroom learning and SPOC learning were both valued, learners

had higher satisfaction and perceived more effectiveness of F2F classroom learning over SPOC-based learning. These results may be attributed to the nature of F2F interaction and the fact that more resolution-phase learning happened. With verbal cues, the synchronous F2F interaction resembles real-life communication in which learners can practice speaking and listening skills in natural contexts. Additionally, they could put what they learned into practice and get real-time feedback and correction, culminating in the phase of resolution, the final step of PIM in cognitive presence. Therefore, all levels of learning objectives could be met and learners' 4C skills could be developed.

Several pedagogical implications can be drawn based on the distribution of CoI presences in the SPOC-based blended environment in **Figure 2**. First, to engage more students in deep learning, especially the resolution phase of the inquiry model, teachers could design some tasks that require learners to correct their errors or further apply the learned knowledge. For example, after discussion activities, the teacher could ask students to revise their oral work based on the feedback given and resubmit their modified work on the SPOC platform. Second, to enhance social presence in the SPOC learning area, other communication tools that can provide voice-based or video-based communication can be integrated. Moreover, the teacher could set frequent online office hours when he/she could offer prompt feedback and engage in discussion actively. Meanwhile, teachers could establish online cooperation and communication standards, such as required involvement and response deadlines. In addition, gamification can be integrated to make the interaction more enjoyable, such as giving thumb-ups and badges to encourage participation and interaction. Informal interactions such as greetings, joking, and sharing life and learning experiences should be encouraged in the discussion forum.

LIMITATION AND CONCLUSION

This study designed and implemented a SPOC-based blended EFL course to promote deep learning from the perspective of the CoI framework. The findings from this mixed-method study on EFL learners' perception of learning experience indicate that this SPOC-based learning approach has fostered a CoI in the BL environment and gained high satisfaction from the learners. Both SPOC-based online learning and F2F classroom learning contributed to establishing teaching presence, social presence and cognitive presence. Deep learning has occurred in SPOC online and F2F classroom learning areas. Finally, several pedagogical suggestions for successfully designing and implementing SPOC-based blended EFL learning courses were proposed based on the distribution of teaching, social and cognitive presences in the BL environment.

The present study has a significant theoretical contribution and pedagogical implications for educators and instructional designers. The findings can guide educational institutions considering utilizing or already using SPOCs on how to successfully integrate SPOC learning and F2F learning to foster deep learning. Furthermore, this research broadens the body of knowledge already available on the CoI framework by demonstrating its suitability and resilience in a BL setting, especially when it comes to EFL contexts. It demonstrated how teaching, social and cognitive presences distribute and differ in the SPOC-based BL environment compared to other online or BL settings.

However, when generalizing the findings, it is essential to keep in mind the limitations of this study, such as the sample size, study setting, gender imbalance and the relatively short experimental duration. To validate research findings and gain a deeper understanding of EFL learners' learning experiences and perceptions, larger sample sizes with a more balanced gender distribution could be adopted in future studies in colleges with various settings, especially in different EFL contexts. Moreover, to investigate the deep learning outcomes in greater detail and ascertain whether the CoI may be maintained and even strengthened over time, longer experimental periods will be required for future research.

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Declaration of interest: The authors declare no competing interest.

Data availability: Data generated or analyzed during this study are available from the authors on request.

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