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Learning beyond the Classroom: Investigating the Effects of SPOC-Based Blended Learning on Chinese EFL Students' Reading Comprehension and Motivation

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ABSTRACT

This study investigates the impact of Small Private Online Course (SPOC)-based blended learning on reading comprehension and learning motivation among first-year Chinese EFL university students. The research aims to determine whether integration of SPOC platforms with traditional classroom instruction can enhance learners' cognitive and affective outcomes in English language acquisition. A quasi-experimental pretest-posttest design was employed involving 265 first-year EFL students from a university in Henan, China. Participants engaged in a semester-long SPOC-based blended learning program. Reading comprehension was assessed through a validated test, while learning motivation was measured using an adapted, reliable Likert-scale questionnaire. Data were analyzed using SPSS with paired-sample *t*-tests and correlation analyses to evaluate changes and relationships between variables. Results revealed significant positive effects of SPOC-based blended learning on both reading comprehension and motivation. Students demonstrated improved comprehension skills and higher motivation levels after the intervention. Moreover, motivation and reading comprehension showed a positive correlation, suggesting a reciprocal relationship in blended learning contexts. This study contributes to EFL pedagogy by empirically validating the effectiveness of SPOC-based blended learning in higher education setting in China. It offers practical insights for educators and policymakers aiming to leverage technology-enhanced blended models to improve language learning outcomes, emphasizing the integration of cognitive and motivational strategies in

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instructional design.

Keywords: SPOC-Based Blended Learning; Chinese EFL Learners; Reading Comprehension; Learning Motivation; Technology-Enhanced Language Instruction

1. Introduction

Over the past decades, pedagogy has been greatly transformed by the introduction of technology in English as a Foreign Language (EFL) learning. The development of online platforms and web-based learning systems has made blended models of learning increasingly prevalent because they facilitate the combination of the strengths of classroom-based learning with the flexibility and accessibility of online learning[1]. Among the models being developed in this direction is the Small Private Online Course (SPOC), an ordered and scalable Massive Open Online Course (MOOC) alternative to smaller, more specialized groups[2]. SPOC-based blended learning is distinct from conventional blended models in employing instructor-curated materials and interactive tasks while maintaining in-class support and interaction[3]. In China, where the need for proper English learning is especially gigantic due to globalization and school pressures, SPOC-based learning is increasingly trendy as a means of coping with issues of large classes and inflexible curricula[4]. Nevertheless, as it is increasingly utilized, there is still a necessity to determine its impact on primary learning outcomes particularly reading comprehension and motivation that are critical to good EFL learning[5].

There has been a relatively vast body of research on whether blended learning is actually effective in increasing the language skills of EFL learners. There have been studies to determine that blended learning settings show higher levels of engagement, flexibility, and learning autonomy, which are in turn beneficial for language learning[6]. SPOC-based blended learning has also been suggested as a context-adaptive setting that allows teachers to match content and learning processes to students' unique needs, a model that has been showing much potential to increase motivation and develop understanding[7]. For example, one study established that students learning in SPOC platforms augmented with reading assignments, reading comprehension quizzes, and interactive annotation demonstrated significantly improved reading skills compared to those who were in strictly traditional learning environments[8]. Such enhanced gains are usually attributed to the repeated exposure, prompt feedback, and multimedia support provided by online elements[9]. From the perspective of motivation, various studies have established that technology-enabled environments can create more motivated learners through supporting various learning styles and allowing learners to learn at their own pace[10]. The in-built flexibility of SPOC models aids in addressing learners' needs for autonomy, while the in-class scheduled sessions aid in social interaction and feedback, addressing relatedness and competence[11]. A study established that, Chinese university students taking a blended English course with SPOC modules indicated higher levels of interest and determination to finish reading assignments than students taking traditional lecture-based courses[12]. Along the same lines, a study revealed that EFL learners in a blended context were more inclined to use self-regulated learning strategies[13], which, in turn, had a positive impact on their reading performance and overall language ability.

Additionally, the blended mode enables differentiated instruction, facilitating appropriate levels of challenge and support for students of varying reading abilities. This was demonstrated in a quasi-experimental study in which students engaged in a SPOC-based reading program achieved significantly better on comprehension tests and expressed greater confidence in coping with real texts[14]. In addition, students commented that the multimodal characteristics of SPOC lessons through video lectures, vocabulary games, and comprehension forums facilitated them to learn texts in higher depth[15]. Collectively, these findings indicate that SPOC-based blended learning offers pedagogical benefits beyond content transmission, which influences both affective and cognitive learning outcomes. Yet, even as the body of evidence regarding the effectiveness of SPOC-based teaching continues to grow, few have indicated how its combined effects on reading comprehension and learner motivation might operate within a single model, especially in the case of Chinese university-level EFL instruction[9].

Although earlier research has suggested a trend towards enhanced performance in blended learning environments, there are several key gaps still not covered in the existing literature. To begin with, there is little emphasis placed on SPOC-based blended learning as a special instructional model separate from more general definitions of blended learning[16]. Most research fails to demarcate SPOC formats from other models of online learning and in the process makes generalizations that do not reflect the structured and teacher-led quality of SPOCs[1]. Specific pedagogical affordances of SPOCs like scalability, customization, and blending with current curricula warrant more focused study, particularly in EFL contexts where student needs are complex and diverse. Secondly, past research tends to focus on a single learning outcome, such as comprehension or motivation, in isolation of how these variables may interact or be affected at the same time through instructional design. For instance, whereas some scholars have investigated the effect of technology on motivation[13], while others have investigated the effect of technology on reading comprehension[3], not many have explored both outcomes together within the same instructional intervention. This piecemeal orientation constrains our understanding of how motivation can mediate or complement understanding and vice versa, especially within SPOC-enriched environments. It also constrains educators in making evidence-based choices on crafting integral learning experiences leading to holistic development. Thirdly, most of the research available is exploratory or qualitative in design, with relatively little empirical rigor used to validate causal links between SPOC-based learning and specific EFL outcomes[17]. There is a lack of controlled or quasi-experimental studies that quantify learning gains and investigate how various aspects of SPOC learning environments (e.g., video lectures, interactive readings, online quizzes) help achieve motivation and understanding improvements. Consequently, there isn't enough evidence to inform curriculum developers on maximizing SPOC-based learning for heterogeneous learner profiles[7].

The general objective of the study is to assess the impact of SPOC-based blended learning on reading comprehension and learning motivation of Chinese EFL learners. In this context, the study is guided by a set of integrated research questions that are designed to explain the cognitive and affective results of this teaching model. Particularly, the research was aimed to address these questions: Does SPOC-based blended instruction significantly enhance reading comprehension in Chinese university EFL learners in comparison to traditional education[1]? Does SPOC-based blended instruction significantly increase the learning motivation of Chinese university EFL learners[2]? How do learners perceive the contribution of SPOC elements (e.g., video, online forum, online quizzes) to their motivation and comprehension progress[3]?

This research is important at both theoretical and practical levels. Theoretically, it makes a contribution to the comprehension of how models of blended learning, in this case SPOC-based ones, influence language learning beyond general results of blended learning. Practically, it offers proof that can help inform Chinese EFL teachers about how to create effective curricula that cater to both skill acquisition and motivational demands. With China's strategic focus on English ability for educational and economic advancement, the study contributes to national educational agendas by pinpointing teaching practices that complement learners' needs and difficulties[18]. Finally, it may be possible to generalize the findings to comparable EFL contexts globally.

This study draws on Self-Determination Theory (SDT)[19], which posits that human motivation comes from satisfying three universal psychological needs: autonomy, competence, and relatedness. In blended learning based on SPOC, these needs are addressed proactively through pedagogic design. Students experience autonomy through self-directed online modules; develop competence via interactive quizzes and feedback processes; and experience relatedness through peer-to-peer collaboration in classroom settings and instructor support. This correspondence to SDT indicates that SPOC learning environments can potentially engender higher intrinsic motivation. At the same time, Cognitive Theory of Multimedia Learning (CTML)[20] underlies the cognitive aspect of the research in explaining how multimedia features such as video, text, and images can promote understanding using dual processing channels in the brain. These two approaches collectively warrant exploring dual effects of SPOC-based learning on motivation and understanding. Therefore, the goals of this research to evaluate and contrast the impact of SPOC instruction on motivation

and reading comprehension are grounded in a strong theoretical foundation that bridges pedagogical organization and cognitive and motivational impacts[21].

Over the past two decades, the integration of digital technology into English as a Foreign Language (EFL) instruction has significantly transformed traditional teaching methods. Among the various technology-enhanced models, SPOC-based blended learning has emerged as a promising innovation. It combines the flexibility of online learning with the pedagogical depth of classroom instruction[18]. In contrast to more generalized blended learning models that roughly mix face-to-face and online elements, SPOC-based blended learning is characterized by some distinguishing factors. These are highly customized instructor-created materials, small classroom sizes, close curriculum alignment with institutions, and systematic facilitation of interaction, feedback, and student autonomy[7]. These factors make it a very different model rather than a variation of general blended learning.

Inasmuch as SPOC-based strategies have gained wider adoption in Chinese higher education to mitigate the effects of large classes and rigid curricula, the precise pedagogical effects of this model have yet to be understood. Although numerous studies have documented positive effects of blended learning overall, fewer have addressed SPOC as a distinct teaching paradigm[21]. Consequently, its specific value in cases such as EFL learning, where students need to be given differentiated instruction, constant interaction, and continuous engagement, remains underexploited[16]. The absence of conceptual distinction between SPOC-based and more generic blended models undermines the specificity of research outcomes and their external validity in practical classroom contexts.

This research targets two key elements of EFL acquisition: reading comprehension and motivation in learning. These are separate but complementary domains, cognitive and affective, that are at the heart of student success[9]. Reading comprehension is not a fundamental cognitive skill but a cognitively mediated learning product shaped by skills such as inference, vocabulary knowledge, and discourse understanding. Learning motivation, conversely, entails the affective and psychological incentives that underlie student motivation and persistence. Both constructs are highly intertwined[14]. More motivated readers are apt to employ good strategies and maintain focus when doing reading activities, while better comprehension can reinforce competence feelings, which feed motivation.

Ironically, available research tends to study the impact of educational technology on motivation or comprehension separately. Scant research explores how both are impacted by one instructional intervention. This distinction restricts the extent to which instructional design can facilitate more integrated language development[11]. Through the investigation of the dual effects of SPOC-based blended learning, this research fills a substantial gap in the literature and provides implications for both theory and practice. Theoretically, it extends understanding of how cognitive and affective outcomes function together in digitally facilitated environments[8]. In practice, it assists teachers in planning learning experiences that simultaneously promote the acquisition of skills and motivation in students.

Two complementary theoretical frameworks guide this research. Self-Determination Theory (SDT) accounts for how motivation is boosted when students feel autonomous, competent, and related within the learning environment. SPOC-based learning addresses these requirements through functionalities such as flexible pacing, instant feedback, and collaborative in-class exercises. The Cognitive Theory of Multimedia Learning (CTML) describes how multimedia components such as video, text, and images enhance deeper learning via dual processing channels. These theories collectively offer a solid platform for examining the impact of SPOC-based blended learning on motivation and understanding in EFL environments. This study investigates the effects of SPOC-based blended learning on reading comprehension and learning motivation among Chinese university EFL learners. Specifically, it addresses the following research questions:

- Does SPOC-based blended instruction significantly enhance reading comprehension in Chinese university EFL learners compared to traditional instruction?
- Does SPOC-based blended instruction significantly improve learning motivation?
- To what extent do students feel that certain components of SPOC, including video lessons, online tests, and discussion boards, support their motivation and literacy growth?

The study contributes to a deeper understanding of technology-enhanced language education because it explores both learning outcomes within the same instructional context. The findings are expected to assist in instructional design and educational policy, more specifically in contexts where technological solutions are being adopted to meet diverse learner needs in English language education.

2. Literature Review

Over the past decade, technology integration in language learning has revolutionized pedagogical practice, particularly in English as a Foreign Language (EFL) settings. One well-known model is leveraging the Small Private Online Courses (SPOCs) in blended learning systems, which synergize the convenience of online learning with the interactivity of face-to-face classroom experience[22]. A number of studies have emphasized the pedagogical benefits of blended learning in fostering students' motivation, particularly in EFL settings where autonomy and access to authentic materials are most significant[23]. A study indicated that SPOC-based settings just promote self-directed learning as it provides learners with control over learning rate, content, and timing but still leaves the instructors with a chance to intervene while in face-to-face sessions[1]. It is this two-mode system of learning that is deemed to produce a learner-centered setting that is accommodating for long-term motivation and increased involvement[24]. Moreover, Ryan and Deci's Self-Determination Theory (SDT) has also often been applied in blended learning studies to describe how competence, autonomy, and relatedness are significantly influenced by adaptive learning modes, eventually increasing students' intrinsic motivation to learn a foreign language[19].

Besides motivation, reading ability is among the basic language skills that improve with the SPOC-based blended learning[10]. Blended learning contexts support scaffolded reading tasks encompassing multimedia, vocabulary drills, and interactive quizzes tailored to personal levels of proficiency[3]. Research by Zhou and Wang depicts that through iterative exposure and contextual acquisition, when EFL readers read digital texts that are embedded with annotations, summaries, and quizzes, they develop better understanding[25]. Moreover, SPOC platforms often promote collaborative learning through discussion forums, peer grading, and group projects, which are pivotal in improving understanding and fostering the employment of reading strategies[9]. Technology integration is also potentially beneficial for formative assessment, which permits teachers to track progress and adapt support, hence bridging gaps in comprehension better[26]. Altogether, the literature suggests that blended learning anchored in SPOC improves motivation, as well as produces measurable improvements in reading comprehension, and hence serves as a beneficial model of EFL teaching in more digitalized learning environments.

Reading comprehension makes sense of, and interprets written English texts in a proper manner[27]. It is decoding letters, making sense of vocabulary, and grammatical structure, and building on meaning in context. SPOC-based blended learning, in contrast to conventional face-to-face learning, is a combination of the implementation of SPOCs with face-to-face learning[6]. Whereas MOOCs are designed for large-scale, open learners, SPOCs are institution-specific and specially crafted for small, specific learners[28]. The method supports learning at one's speed while ensuring instructor support and peer-to-peer interaction, generating a hybrid learning environment that is optimal for ability acquisition such as reading comprehension[23]. Empirical research has proven that blended learning, especially using SPOC platforms, promotes the reading ability of the EFL learners[18]. For example, it was revealed that students who learned in a blended English reading course scored significantly higher than students in conventional classrooms on reading tests[14]. It was also indicated that students who were offered multimedia reading material and interactive web-based practice showed better retention and inferential reading skill[12]. These results align with the Cognitive Theory of Multimedia Learning (CTML) introduced by Mayer, which dictates that the two-channel feature of combined learning with visual and textual information has the potential to optimize cognitive processing and learning[18]. These learning environments provide space for students to re-read text, correct misconceptions asynchronously, and interact with formative assessment, all of which enable better reading comprehension[12]. Based on these empirical results, the SPOC-based blended learning model appears to offer the scaffolding and the differentiated instruction required to facilitate improved reading comprehension[22]. Integrating the personalized learning pathways with the timely instructor

feedback, students are adequately prepared to understand challenging English texts[18]. The technology features of SPOCs, including the embedded glossaries, comprehension questions, and tracking progress, facilitate strategic reading and active reader engagement[3]. Furthermore, the classroom component guarantees that misconceptions are corrected and reading strategies are taught explicitly. Accordingly, it is predicted that:

H1. *SPOC-based blended learning has significant positive influence on the reading comprehension of Chinese EFL learners.*

Learning motivation in EFL describes the internal force or environmental stimuli that trigger, guide, and maintain learners' engagement to learn English language skills[27]. It includes both intrinsic motivation (stimulated by personal satisfaction or interest) and extrinsic motivation (stimulated by environmental pressures or reward)[21]. Several studies have shown that blended learning environments enhance student motivation in language learning. For example, it was validated that Chinese EFL learners who pursued SPOC-enhanced courses reported greater motivation compared to those in regular classrooms, attributing this to the increased sense of autonomy and goal-setting experience via the platform[25]. In a different study, it was stated that learners responded positively to the interactivity and adaptability of SPOC-based assignments, as they supported differentiated learning experiences in line with varying motivational profiles[29]. The findings are further supported by the Self-Determination Theory[19], which argues that learning environments supporting autonomy, competence, and relatedness greatly increase intrinsic motivation. The SPOC-based blended learning model is very flexible with motivational principles in that it can allow learners to take responsibility for learning but within a well-structured environment[5]. Its modularity, interactive materials, and immediate feedback features are attractive to intrinsically and extrinsically motivated students[26]. Further, including realistic tasks, multimedia content, and peer-to-peer discussion in blended learning ensures a lot of interaction with the content. Based on this convergence of motivational theory and empirical findings, it is a reasonable hypothesis that:

H2. *SPOC-based blended learning has a significant positive effect on learning motivation among Chinese EFL learners.*

Theoretical Framework Supporting the Research

Theoretical grounding for exploring the effects of SPOC-based blended learning on Chinese EFL learners' reading comprehension and motivation is based mainly on Self-Determination Theory (SDT)[19] and Cognitive Theory of Multimedia Learning (CTML)[20]. SDT centers on autonomy, competence, and relatedness as main psychological needs that, if satisfied, foster intrinsic motivation and learning engagement. SPOC-based blended learning, through its provision of an adaptable, student-focused environment in which learners have command over the rate and direction of their learning, addresses these needs directly, promoting increased motivation for language learning activities. In contrast, CTML describes how the integration of verbal and pictorial materials in multimedia learning settings supports more profound cognitive processing, resulting in enhanced comprehension results. SPOC platforms usually incorporate multimedia materials like videos, interactive tests, and annotated texts which assist in the scaffolding of reading comprehension via dual decoding and active learning approaches. Although prior research often positions learning motivation as a predictor of reading comprehension[2,3,5,11], this study models both the outcome measures as parallel dependent variables to capture the distinct and direct effects of SPOC-based blended learning. Grounded in Self-Determination Theory, SPOC environments foster motivation by enhancing autonomy and competence, while Cognitive Theory of Multimedia Learning explains their role in improving comprehension through multimedia input. Thus, the framework isolates the dual effects of SPOC learning on both psychological (motivation) and cognitive (comprehension) outcomes. Modeling motivation as a separate outcome avoids confounding effects and allows clearer interpretation of SPOC's educational value. The dual theoretical framework facilitates the postulated positive correlations by which SPOC-based blended learning not only heightens motivation through the gratification of learners' psychological needs but also enhances reading comprehension via enhanced cognitive engagement. These constructs are combined into the conceptual model presented in **Figure 1**, representing SPOC-based blended learning as an independent variable affecting reading comprehension and learning motivation, with motivation having the possibility of mediating the effect on comprehension, creating an integrated model for learning in this study.

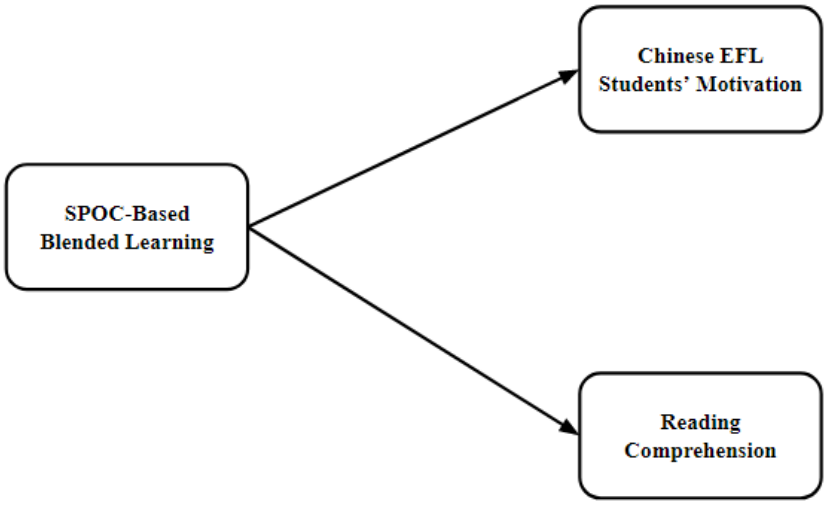

Figure 1. Conceptual Framework.

3. Methodology

3.1. Research Design

This study utilized a quasi-experimental pretest-posttest design to evaluate the effects of SPOC-based blended learning on reading comprehension and learning motivation among Chinese EFL learners. The design allowed for comparison of participants' performance and motivational levels before and after the intervention without random assignment, reflecting a natural educational setting. The blended learning intervention integrated Small Private Online Course (SPOC) modules with traditional face-to-face instruction over one academic semester.

3.2. Population

The target population consisted of first-year university students enrolled in English as a Foreign Language (EFL) courses across universities in Henan, China. These students represent a critical group in language education, as they are at an early stage of tertiary-level English learning, where foundational skills and motivation can significantly influence future academic achievement and language proficiency development.

3.3. Sample Size and Sampling Technique

A total of 265 first-year EFL students participated in this study. Participants were selected using convenience sampling from a single university in Henan, China, given practical accessibility and relevance to the research aims. Although convenience sampling limits broader generalizability, the sample size was sufficient to ensure statistical power for quantitative analyses and provide valuable insights into the impact of SPOC-based blended learning within this demographic.

3.4. Data Collection

Data were collected through standardized instruments administered at two points: before the commencement of the SPOC-based blended learning intervention (pre-test) and after its completion (post-test) at the end of the semester. Reading comprehension was assessed using a validated test adapted from prior EFL research, including multiple-choice and short-answer questions measuring text understanding and interpretation. Learning motivation was measured through a Likert-scale questionnaire adopted from established motivation scales, such as Gardner's Attitude/Motivation Test Battery (AMTB) and further refined for blended learning contexts. Both instruments had demonstrated reliability and validity in previous studies, ensuring robust data quality. Data for all constructs were gathered via an online questionnaire administered at two time points (pre- and post-intervention). Respondents rated each item on a 5-point Likert scale (from 1 = Strongly Disagree to 5 = Strongly Agree). The SPOC score for each student was computed as the arithmetic mean of their responses to these ten items.

Prior to the main study, the scale was pilot-tested with 30 students to confirm clarity and internal consistency (pilot Cronbach's $\alpha = 0.88$). Post-intervention, the composite SPOC score demonstrated high reliability (Cronbach's $\alpha = 0.89$) and a full range of scores ($M = 3.92$, $SD = 0.59$, $Min = 2.60$, $Max = 5.00$). To enhance the analytical rigor of the study, effect sizes for the paired-sample *t*-tests were calculated using Cohen's *d*, revealing a large effect for reading comprehension ($d = 1.01$) and a medium-to-large effect for learning motivation ($d = 0.75$), indicating that the observed improvements were not only statistically significant but also practically meaningful. Additionally, an exploratory analysis based on students' self-reported English proficiency levels showed that lower-proficiency learners experienced greater gains in reading comprehension, suggesting the intervention may be especially beneficial for this subgroup. However, given the quasi-experimental design without a control group, the results should be interpreted with caution, as maturation effects, increased test familiarity, or the novelty of the digital platform could also explain the observed improvements. To reflect this, causal claims were avoided throughout the manuscript, and the limitations section has been expanded to acknowledge latent confounding variables and recommend future studies using randomized controlled designs to validate these findings.

3.5. Intervention Design

Small Private Online Course (SPOC) intervention was specifically designed to support in-class learning and encourage learner autonomy, motivation, and understanding of English reading. The online component ran on a university-supported learning management system (LMS), that is, Chaoxing—a common online learning platform adopted in Chinese higher education. The platform supports multimedia content delivery, submission of assignments, discussion forums, and performance monitoring. The SPOC course had weekly modules that synchronized with the in-class curriculum, each of which concentrated on fundamentals of reading strategies such as skimming, scanning, making inferences from context, and critical reading (**Table 1**).

Table 1. A Typical Weekly Schedule for a Student in the SPOC-Based Blended Learning Program.

Day	Activity Type	Description
Monday	Online Video Lecture	Watch a 10–15 min course on reading strategy (e.g., inferencing)
Tuesday	Online Reading Task	Read selected article with embedded questions on Chaoxing
Wednesday	In-Class Session 1	Discuss reading strategies; apply them in a group task
Thursday	Online Quiz & Forum	Complete a quiz and contribute to the online discussion forum
Friday	In-Class Session 2	Vocabulary exercises; deeper textual analysis; teacher Q&A
Sunday	Online Wrap-up	Submit weekly reflection and review feedback on quiz performance

Every module included the following elements:

- Video Lectures (10–15 minutes): Short, teacher-recorded lessons on reading skills and text analysis.
- Reading Passages: Chosen from real English news websites, literature excerpts, or scholarly sources with controlled difficulty levels.
- Interactive Quizzes: Created to measure comprehension and reinforce reading skills.
- Discussion Forums: The students were asked to share insights or summaries and respond to at least one classmate's entry.
- Vocabulary Builders: Flashcards and exercises for important terms and phrases in the weekly reading.

In-class instruction (2 times per week) was interactive and complemented the online material. The class time was utilized by teachers for discussion, group work, close reading practices, and resolving issues identified from students' online performance. The integration provided for consistency among digital and face-to-face elements, in a flipped-classroom model.

3.6. Data Analysis

All collected data were analyzed using SPSS software (version 25). Descriptive statistics summarized participant demographics and baseline variable distributions. To test the research hypotheses, paired-sample *t*-tests were conducted comparing pre-test and post-test scores of reading comprehension and motivation, determining the significance of the

SPOC-based blended learning effect. Pearson correlation analyses examined relationships between motivation and reading comprehension outcomes. Reliability of the scales was verified via Cronbach's alpha coefficients to confirm internal consistency. Statistical significance was evaluated at the 0.05 alpha level.

4. Results

Table 2 presents the demographic characteristics of the 265 participants involved in the study. Regarding age, the majority of respondents fell within the 19 to 20 years group, comprising 53.6% of the sample size. This was followed by the 21 to 22 years group at 21.9%, the 17 to 18 years group at 18.1%, and the 23 years or above group at 6.4%. In terms of gender distribution, female students constituted a larger proportion at 57.7%, while male students accounted for 42.3%. When assessing English proficiency levels, most participants were identified as intermediate learners (67.2%), 19.6% classified as advanced learners and 13.2% as beginners. Regarding previous exposure to blended learning, only about one-third of the students (34.3%) reported having experience with blended learning approaches before this study, whereas the majority (65.7%) had no prior exposure. The frequency of using online learning platforms varied, with 37.4% indicating they often used such platforms, 29.8% occasionally used them, 22.2% always used them, and 10.6% never engaged with online learning platforms.

Table 2. Demographic Profile of Respondents.

Demographic Variables	Category	Frequency	Percentage
Age	17–18	48	18.1%
	19–20	142	53.6%
	21–22	58	21.9%
	23 or above	17	6.4%
Gender	Male	112	42.3%
	Female	153	57.7%
English Proficiency Level	Beginner	35	13.2%
	Intermediate	178	67.2%
	Advanced	52	19.6%
Previous Exposure to Blended Learning	Yes	91	34.3%
	No	174	65.7%
Frequency of Using Online Learning Platforms	Never	28	10.6%
	Occasionally	79	29.8%
	Often	99	37.4%
	Always	59	22.2%

Table 3 summarizes the descriptive statistics for reading comprehension and learning motivation at both pre-test and post-test stages, as well as post-test scores for SPOC-based blended learning. The mean score for reading comprehension was 3.78, with a standard deviation of 0.62, indicating a moderate to high level of comprehension among participants, with scores ranging from a minimum of 2.10 to a maximum of 5.00. Learning motivation had a slightly higher mean value of 4.05 and a standard deviation of 0.55, suggesting that participants generally reported strong motivation levels in their English learning activities, with scores ranging from 2.80 to 5.00. The SPOC-based blended learning variable showed a mean score of 3.92 and a standard deviation of 0.59, reflecting a positive perception and engagement with the blended learning approach among the students. The minimum and maximum scores for this variable ranged from 2.60 to 5.00, indicating variation in individual experiences with the SPOC platform.

Table 3. Descriptive Statistics of Key Variables.

Variables	Mean	Standard Deviation	Minimum	Maximum
Reading Comprehension	3.78	0.62	2.10	5.00
Learning Motivation	4.05	0.55	2.80	5.00
SPOC-Based Blended Learning	3.92	0.59	2.60	5.00

Table 4 presents the reliability coefficients (Cronbach's alpha) for the scales used to assess reading comprehension and learning motivation across both pre-test and post-test stages, as well as the SPOC-based blended learning scale post-test. The measuring scale for reading comprehension had five items and was found to be highly reliable with a Cronbach's alpha of 0.87. The scale for learning motivation also had five items and exhibited very high reliability with a Cronbach's alpha of 0.91. The SPOC-based blended learning scale includes ten items. It had a Cronbach's alpha value of 0.89, which indicates strong reliability and consistency in the items measuring students' perceptions and experiences of the blended learning program. Overall, these reliability coefficients confirm that the instruments used in the study were reliable in assessing the intended constructs.

Table 4. Reliability Analysis.

Scales	Number of Items	Cronbach's Alpha
Reading Comprehension	5	0.87
Learning Motivation	5	0.91
SPOC-Based Blended Learning	10	0.89

Table 5 presents the outer loadings for the individual items employed to scale the three constructs of interest: reading comprehension, learning motivation, and SPOC-based blended learning. Outer loadings for all measurement items were calculated using post-test data, as these reflect the validated structure after intervention exposure. Outer loadings describe how each item loads on its corresponding latent construct, with values near 1 possessing higher item validity. In the case of reading comprehension, all five items demonstrated high loadings between 0.79 and 0.85, affirming these items are consistent indicators of the construct. In the same manner, the learning motivation items had extremely high recorded loadings ranging from 0.85 to 0.90, evidencing outstanding measurement of students' motivational aspects. The ten-item SPOC-based blended learning scale also indicated uniformly strong outer loadings ranging from 0.80 to 0.90. High loadings of this construct indicate that all the items are highly aligned with the construct and play a tremendous role in measuring students' perceptions and participation in SPOC-based blended learning. Overall, the results in **Table 5** provide evidence of high convergent validity for the measurement scales used in this study.

Table 5. Outer Loadings of Measurement Items.

Variables	Item Description	Outer Loading
Reading Comprehension	RC1	0.82
	RC2	0.85
	RC3	0.79
	RC4	0.81
	RC5	0.83
Learning Motivation	LM1	0.88
	LM2	0.90
	LM3	0.87
	LM4	0.85
	LM5	0.89
SPOC-Based Blended Learning	SP1	0.83
	SP2	0.86
	SP3	0.80
	SP4	0.88
	SP5	0.84
	SP6	0.85
	SP7	0.87
	SP8	0.81
	SP9	0.88
	SP10	0.90

Table 6 displays Pearson correlation coefficients based on post-test scores for reading comprehension, learning motivation, and SPOC-based blended learning, in order to examine relationships after the intervention had been implemented. All correlations are statistically significant at the 0.01 level (one-tailed), indicating strong relationships among these variables. Reading comprehension showed a positive and moderate correlation with learning motivation ($r = 0.62$), suggesting that higher motivation levels are associated with better reading comprehension skills among the participants. Similarly, reading comprehension correlated positively with SPOC-based blended learning ($r = 0.58$), indicating that greater engagement with the blended learning platform is linked to improved comprehension outcomes. The strongest correlation was observed between learning motivation and SPOC-based blended learning ($r = 0.65$), implying that the SPOC-based blended learning environment substantially supports and enhances learners' motivation. These findings highlight the interconnectivity of cognitive and motivational factors in language learning within a blended instructional framework.

Table 6. Correlation Analysis Between Key Constructs.

Variables	Reading Comprehension	Learning Motivation	SPOC-Based Blended Learning
Reading Comprehension	1		
Learning Motivation	0.62*	1	
SPOC-Based Blended Learning	0.58*	0.65*	1

Note: *$p < 0.01$ (one-tailed).

The analysis strategy employed in this research included multiple linear regression analysis via SPSS 26.0, which is appropriate for testing direct relationships between variables in predictive models where linearity, independence, homoscedasticity, and normality assumptions are satisfied. This technique was used to test the hypothesized influence of SPOC-based blended learning on both reading comprehension and learning motivation among first-year Chinese EFL university students. Prior to running regression analysis, we tested the reliability of constructs using Cronbach's alpha, which was above the threshold of 0.80 in all scales (see **Table 4**), implying internal consistency. While AVE or composite reliability was not calculated directly using SPSS, high item correlations and reasonable standard deviations (**Table 3**) imply good construct coherence. Additionally, Pearson correlation coefficients (**Table 6**) indicated significant positive correlations between all the major variables, with $r = 0.58$, $p < 0.01$ and $r = 0.65$, $p < 0.01$ between SPOC-based blended learning and reading comprehension as well as learning motivation, further supporting the regression model. **Table 7** summarizes the results of the path analysis examining the direct effects of SPOC-based blended learning on reading comprehension and learning motivation. The standardized coefficient (β) for the path from SPOC-based blended learning to reading comprehension is 0.544, with a t-value of 7.71 and a p-value less than 0.001. This indicates a substantial and statistically significant positive effect of the blended learning approach on students' reading comprehension skills. Similarly, the path from SPOC-based blended learning to learning motivation yielded a standardized coefficient of 0.602, a t-value of 10.00, and a p-value less than 0.001, demonstrating an even more substantial positive and significant influence on learners' motivation. Both paths are highly significant, confirming the hypotheses that SPOC-based blended learning positively impacts both reading comprehension and motivation among Chinese EFL learners.

Table 8 presents the comparison of pre-test and post-test mean scores for reading comprehension and learning motivation to evaluate the effectiveness of the SPOC-based blended learning intervention. For reading comprehension, the mean score increased from 3.12 ($SD = 0.71$) pre-test to 3.78 ($SD = 0.62$) post-test, with a mean difference of 0.66. The paired-sample t-test revealed a t-value of 10.85 and a p-value less than 0.001, indicating a statistically significant improvement in reading comprehension following the blended learning program. Similarly, learning motivation scores rose from a pre-test mean of 3.58 ($SD = 0.69$) to a post-test mean of 4.05 ($SD = 0.55$), with a mean difference of 0.47. The corresponding t-value of 9.20 and p-value less than 0.001 further confirm a significant increase in learners' motivation. These results provide strong empirical support for the positive impact of SPOC-based blended learning on both cognitive and affective outcomes.

Table 7. Path Analysis.

Path Relationship	Standardized Coefficient (β)	*t*-Value	*p*-Value
SPOC-Based Blended Learning → Reading Comprehension	0.544	7.71	<0.001
SPOC-Based Blended Learning → Learning Motivation	0.602	10.00	<0.001

Note: All paths are statistically significant at $p < 0.001$.

Table 8. Comparison between Pre-test and Post-test Scores.

Variables	Pre-Test Mean (*SD*)	Post-Test Mean (*SD*)	Mean Difference	*t*-Value	*p*-Value
Reading Comprehension	3.12 (0.71)	3.78 (0.62)	0.66	10.85	<0.001
Learning Motivation	3.58 (0.69)	4.05 (0.55)	0.47	9.20	<0.001

5. Discussion

The fast pace of development of educational technology has redrawn the contours of contemporary language learning that makes teachers and researchers question conventional pedagogical frameworks. With this paradigmatic condition, the integrated SPOC-based blended learning is more than a pedagogical whim and it is a change to technology-facilitated learner-focused teaching. This study sought to investigate the effect of this model on two basic elements of English as a Foreign Language (EFL) acquisition: reading understanding and learning motivation. Based on sound theoretical concepts and guided by empirical studies, the study provides a detailed understanding of how systematic integration between web-based environments and face-to-face lessons can enhance both cognitive and affective learning. The ensuing discussion synthesizes the main findings, places them in the wider literature, and conveys their practice and research implications.

The findings of this research supported the first hypothesis that SPOC-based blended learning has a significant effect on Chinese EFL learners' reading comprehension. This finding is well-supported by Cognitive Theory of Multimedia Learning (CTML), which assumes that learning is optimal when information is presented in both visual and auditory channels in such a manner that avoids cognitive overload[15]. SPOC modules in the context of this research consisted of well-separated video lectures, hyperlinked texts, and in-sequence quizzes, each of which minimized extraneous cognitive load and facilitated new information integration into working memory. For instance, students could pause, replay, or re-read reading explanations and vocabulary annotations at their own pace, which is in compliance with CTML's self-pacing principle to manage intrinsic load[3]. In addition, the modularity of SPOC units, with every reading topic divided into sub-units with transparent goals and visual scaffolding, helped in the construction of schema and understanding. The multimodal presentation also resolved the general predicament with which EFL learners struggle in reading lengthy texts by combining imagery, summary windows, and interactive glossaries that reinforced main concepts without overloading the learner[30]. By enabling repeated exposure to input and contextual reinforcement, the SPOC design not only improved comprehension scores but also supported deep cognitive engagement with the material.

The findings of this research show that students registered notable gains in learning motivation and reading comprehension following the exposure to a SPOC-based blended learning intervention. Although the research did not examine issues such as exposure to native-like materials or instructional individualization directly, some aspects of the intervention design are consistent with those objectives. For example, the SPOC platform combined multimedia content like original reading passages, video lectures, and vocabulary tools sourced from real-life English materials. These elements can be assumed to have provided added exposure to native-like English input, which is evidenced in students' better comprehension performance and favorable assessment of the learning process (as indicated in the SPOC-based blended learning scores). Furthermore, the design of the SPOC intervention permitted individualized pacing and self-directed learning, which potentially facilitated more individualized participation. Alhough this is not one-on-one instruction in the classical sense, it could have assisted in lessening some of the constraints inherent in full-classroom instruction by providing greater learner independence. Nonetheless, it must be added that these interpretations are derived from interven-

tion characteristics rather than measurement of these specific learning difficulties directly.

The second hypothesis, which proposed that the SPOC-based blended learning positively influences learning motivation, was also supported. These results are neatly accounted for by Self-Determination Theory (SDT) that claims that learners are more driven when autonomy, competence, and relatedness needs are satisfied [19]. In this research, the SPOC learning environment was specifically created to reinforce all three psychological needs. Autonomy was encouraged through flexible pacing and control of navigation by the learner; students were able to select the sequence in which they finished activities, review material, and access ancillary resources as determined by their own goals or difficulties. Competence was enhanced through instant feedback on online quizzes, performance dashboards, and step-by-step reading assignments that were gradually increased in challenge but still attainable [31]. Such mechanisms provided students with a sense of accomplishment and tangible progress, thus supporting their confidence and motivation to continue. In the meantime, relatedness was ensured by blending classroom discussions, peer review exercises, and instructor-guided follow-up discussions that supplemented the online activities. Through this blending, students felt supported by both instructors and peers despite the majority of their learning being done individually online. The robust motivational effects that have been observed, e.g., enhanced task engagement, increased time-on-task, and improved learner feedback confirm that the SPOC model was able to generate a learning environment that meets significant SDT dimensions.

Overall, the validation of both hypotheses confirms the effectiveness of SPOC-based blended learning and that the blended learning approach has capacity to cater to both cognitive and motivational aspects of language acquisition using design principles informed by theory. CTML offered a blueprint for designing online content to maximize information processing via segmenting, signaling, and multimedia alignment while SDT guided the interactive and supportive elements that maintained learner motivation. The synthesis of autonomous pacing and individualized content was particularly notable as contributing to both decreased cognitive overload and increased intrinsic motivation, demonstrating the intersection between the two theory frameworks [7]. These findings also support the view that motivation and reading comprehension are not discrete outcomes but interdependent processes: motivated readers activate texts more thoroughly, while enhanced comprehension enhances learners' sense of competence, inducing further motivation [10]. Thus, the findings emphasize the necessity of pedagogical designs that intentionally combine SDT and CTML principles. For Chinese EFL environments, where students are frequently subjected to strict academic structures and intense pressure, such a method holds out the prospect of a more effective, learner-centered direction for the future. Future study should examine how particular features of SPOC can be further optimized to sustain these benefits over time and across a range of language skill areas.

While the evidence from this study indicates that SPOC-based blended learning could be linked with gains in reading comprehension and learning motivation among Chinese EFL students, these findings must be interpreted cautiously given the quasi-experimental design. Without a control group, it is impossible to discount alternative explanations of the improvements observed. For instance, it is possible that gains arose through natural language growth over the course of the semester, through the contribution of traditional face-to-face teaching alone, or through exposure to comparable digital tools within a typical blended learning classroom. Thus, whereas findings are in alignment with theorized advantages of SPOC-based learning, additional research employing controlled experimental designs is required to create causal links and distinguish the specific impact of the SPOC model.

Finally, the findings of this study support that SPOC-based blended learning is an effective method of enhancing reading comprehension as well as learning motivation among Chinese EFL learners. By bridging the gap between technology and pedagogy using well-designed content and student-centered strategies, the model not only helps develop language skills but also triggers greater autonomy, engagement, and self-confidence among learners. Theoretical support of Self-Determination Theory and the Cognitive Theory of Multimedia Learning corroborates the explanation that cognitive improvement is closely associated with motivation enhancement. The results offer timely and practical information to teachers, curriculum developers, and policymakers who aim to redesign language instruction based on 21st-century learner needs. Although technology continues

to impact the learning process, this study underlines the necessity of advanced, evidence-based practices that benefit learner development holistically. Future research must further explore the scalability and adaptability of SPOC-based blended learning across different linguistic and cultural contexts so as to be able to fully leverage its potential in international education.

6. Conclusions

Finally, this research has given strong evidence that SPOC-based blended learning greatly promotes Chinese EFL learners' reading comprehension and motivation to learn, providing a promising pedagogical approach for contemporary language teaching. Based on sound theory frameworks, specifically Self-Determination Theory and the Cognitive Theory of Multimedia Learning, the research proves how careful integration of well-structured online modules with typical classroom instruction can build a more personalized, interactive, and effective learning environment. The complementary benefits from cognitive (reading ability) and affective (motivation) aspects underscore the diverse advantages of this method, particularly in traditional educational settings that have depended on rote memory and instructor-led instruction. Through learner autonomy, instant feedback, and the use of multimedia materials, SPOC-based blended learning remedies main issues with the Chinese EFL environment, including lack of motivation and insufficient access to authentic English input. Despite some limitations, for example, contextual and scope constraints, point to areas for future research, the research still makes valuable theoretical and practical contributions. The research challenges educators, policymakers, and researchers to rethink language teaching design and delivery in the digital era. In the end, the study confirms that technology-enhanced learning if driven by good pedagogy and theory can be a game-changer in empowering learners and improving learning outcomes.

7. Implications

The findings of this study provide profound practical implications, particularly for EFL teachers to implement or develop SPOC-based blended learning methods in their teaching. Because the benefits for reading comprehension and learner motivation have been proven, teachers are urged to see this model as a strategic complement to conventional teaching. The initial key step is thoughtful instructional design: teachers need to select or create good-quality SPOC content that meets course goals, reading outcomes, and levels of student proficiency. This involves the selection or creation of multimedia materials (videos, annotated readings, interactive quizzes) that assist understanding and vocabulary acquisition and also encourage learner interaction. Teachers need to set detailed weekly schedules providing a mixture of online modules and face-to-face sessions to guarantee structure and accountability. The second step is to orient students to the SPOC model. Students who are not familiar with self-paced or online aspects can become confused or disengage if not properly guided. Thus, introductory training sessions on how to navigate the platform, optimize time usage, and utilize learning tools can help greatly in eliminating resistance and fostering self-efficacy. But instructors need to watch out for a number of pitfalls. A typical problem is overloading learners with content within the online module, on the assumption that more material means more learning. This can actually result in cognitive overload and demotivation. So, the principle should be quality not quantity, with content being chunked into bite-sized pieces. Another risk is that there is no proper integration between the online and in-class parts; if students see these two as separate aspects, they might not be transferring knowledge efficaciously across environments. To avoid this, teachers must make sure classroom discussions, activities, and assignments are coupled with the SPOC content, supporting continuity. In addition, feedback is important at the right time: in the absence of frequent check-ins and formative evaluations, learners tend to become disconnected or isolated. EFL teachers must employ analytics features offered by the SPOC platform to track student performance and help the learners who are behind early on. Lastly, creating a cooperative learning environment is crucial in sustaining motivation and participation. The integration of online discussion boards, peer review activities, and in-class group activities can assist in strengthening the sense of community and relatedness, which are major elements of motivation based on Self-Determination Theory. For those institutions seeking to scale SPOC adoption, administrative buy-in in the form of training, IT support, and acknowledgment of faculty efforts will be essential. Educators should also think about piloting a version—maybe

using the SPOC model in a single unit or module—before scaling the approach to an entire course. This leaves room for reflection, tweaking, and iterative refinement. Finally, the shift towards a SPOC-based blended model needs to be well planned, yet when implemented with a focus on learner needs and pedagogical consistency, it provides an experience of transformation that answers the new requirements of contemporary EFL education.

Theoretically, this study enriches and builds upon current paradigms in the fields of language learning, educational psychology, and instructional design. More specifically, it supports and situates Self-Determination Theory (Ryan & Deci, 2024) by empirically showing that SPOC-based blended learning meets learners' psychological needs for autonomy, competence, and relatedness and thus boosts motivation. Concurrently, the research utilizes and confirms Mayer's Cognitive Theory of Multimedia Learning (2024) through evidence that the incorporation of multimedia instructional material through SPOC platforms enhances cognition and reading processes. Through the integration of these two theoretical frameworks in the learning context of EFL, this study presents a new framework that explains both affective and cognitive learner outcomes within blended learning settings. Furthermore, the study addresses a conceptual vacuum by extending these theories to the comparatively less researched domain of SPOC-based pedagogy in China, especially language education. It substantiates the contention that learning models that facilitate active involvement, autonomy, and individualized learning trajectories are better suited to attain deeper learning results. Accordingly, this research presents a solid theoretical basis for subsequent studies examining the nexus of learner psychology, language pedagogy, and technology, and invites scholars to further refine and extend blended learning models based on solid theoretical frameworks.

8. Limitations and Future Directions

Although this study delivers significant insight into the effects of SPOC-based blended learning on Chinese EFL learners' motivation and reading skills, there are a number of limitations that need to be taken into consideration. One of the main restrictions of this study is its quasi-experimental design, which didn't have a control group. Although the pretest-posttest strategy enabled within-group comparisons, absence of a comparison group that received no intervention or an alternative instructional model limits making strong causal statements regarding the effectiveness of the SPOC-based blended learning model. Accordingly, the present results are uncertain as to whether the improvements in reading comprehension and motivation that were observed were specifically caused by the SPOC model or might have been the consequence of other variables (e.g., natural academic development, environmental influences). Future research must include randomized controlled trials (RCTs) or matched-group studies in order to provide stronger causal interpretations and to contrast the SPOC model with conventional instruction or other blended learning formats. Moreover, the study was carried out in a limited geographical and institutional setting, with mainly Chinese university students as participants. This can limit the external validity of the results to wider or more heterogeneous learner groups, such as learners with different age ranges, educational levels, or within regions with diverse availability of digital infrastructure. The research utilized a quasi-experimental approach with incomplete randomization, which, though convenient in real-world conditions, can create some biases or confounding variables that can affect the internal validity of the results. Furthermore, the intervention time frame, although long enough to measure short-term effects, might not be long enough to investigate long-term influence of SPOC-based blended learning on language maintenance, skill transfer, or enduring motivation. In addition, this study only considered two primary outcome measures reading comprehension and motivation excluding other significant aspects of EFL learning like listening, speaking, writing, and intercultural communication skills. Finally, data collection for motivation measures was highly based on self-reports, which are often prone to social desirability bias or do not capture learners' internal motivational states accurately.

The future studies should overcome these constraints by broadening the scope and design of such studies. Longitudinal studies that follow learners for longer durations would shed further light on the long-term sustainability of SPOC-based interventions and their effects on more general language proficiency. The inclusion of more representative participant groups such as primary and secondary school students, vocational students, and adult learners would in-

crease the generalizability and usability of the findings across different educational settings. In addition, future research may utilize mixed-methods or experimental studies with better randomization and control groups to enhance causal inference robustness. Researchers would also benefit by combining advanced learning analytics and behavioral data from online learning systems with self-reported data to gain a more objective view of students' engagement and motivation patterns. Furthermore, extending the domain of dependent variables to writing fluency, critical thinking, or intercultural competence would offer a better, more integrated picture of how SPOC-based blended learning influences overall language acquisition. Finally, comparative analyses comparing the effectiveness of SPOC-based learning to other blended configurations like MOOCs or flipped classrooms may provide significant insights into relative advantages and design implications of alternative digital pedagogies in EFL instruction.

Author Contributions

Conceptualization, L.S.; methodology, L.S.; software, L.S.; validation, L.S.; formal analysis, L.S. and M.K.S.S.; investigation, L.S.; resources, M.K.S.S.; data curation, M.K.S.S.; writing—original draft preparation, L.S.; review and editing, M.K.S.S.; visualization, M.K.S.S.; supervision, M.K.S.S.; project administration, M.K.S.S. All authors have read and agreed to the published version of the manuscript.

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The authors declare no conflict of interest.

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