Interest-driven creator English course for developing Chinese private college students' listening and speaking proficiency based via blended setting

Yongkang Wang
  Chinese International College, Dhurakij Pundit University

Pengfei Chen (✉ blissfulalice@gmail.com)
  Chinese International College, Dhurakij Pundit University

Research Article

Abstract

The aim of this study is to improve the English learning outcomes of undergraduate students enrolled in bachelor's degree by designing a compulsory interest-driven creator (IDC)-based English course in blended setting. A total of 210 Chinese college students participated in a quasi-experimental intervention. The research treatment was conducted for 16 lessons over 16 weeks at a private college in China. The performance of the experimental group (EG) and the control group (CG) was assessed by Exam English as a pre-test and a post-test to investigate listening and speaking proficiency. The results indicated that the course effectively enhanced the students' language learning outcomes. Therefore, the IDC course can be integrated in an innovative English curriculum. The EG showed a better outcome on the test than the CG. The IDC English course in the blending setting efficiently enhanced the students' English listening and speaking skills.

Introduction

Scholars (Pelletier et al., 2021) have envisaged an inevitable future trend for post-epidemic based on the design of innovative instructional technology. As a result, traditional HEIs pedagogy will become less competitive and desirable (Xing & Bolden, 2019). The conventional pattern of HEI (Chen & Zou, 2018), known as task-based language teaching with the exam-orientated system, remains common. Nevertheless, an innovative and dynamic pedagogy (Xie et al., 2019) should be adopted immediately to close the gap between curricular, extracurricular knowledge and learning habits produced by the current less productive and bureaucratic regime.

The gap for Chinese college students is based on the fact that they are digital natives, but they are not necessarily aware of digital technologies or skilled in their use, particularly in terms of learning outcomes (Almazova et al., 2020). The academic listening and speaking competence of Chinese ESL/EFL learners in colleges is relatively low in the Asian region based on their performance of international tests, precisely the official criterion for matching the standards (CEFR) in IELTS test data (IELTS, 2018; IELTS, 2019; IELTS, 2021). Chinese ESL/EFL learners' competence in the overall academic listening and oral examination was less than that of learners in Thailand and Japan from 2018 to 2021, according to the recent score data from 2021, Chinese learners' 6.0 in listening and 5.6 in speaking is still inferior to Thailand's 6.3 and 5.8 and Japan's 7.6 and 6.8. Therefore, effective approaches are needed to enhance the listening and speaking skills of Chinese ESL/EFL learners from 2020. On this basis, blended setting in an English as a second/foreign language (ESL/EFL) classroom interaction and linguistics outcome (Ginaya et al., 2018) becomes an practical choice for interest-driven creator (IDC) courses (Chen et al., 2018).

As a result, this study intends to develop an IDC course to improve Chinese college ESL/EFL students' listening and speaking competence. The curriculum's highlighted learning process (Tan et al., 2020) involves incorporating, correlating technology into instructions and habits to assist language proficiency. The anchored concept is the creation of habits by interest based on a three-component 'loop' to establish

a coherent learning process: the 'trigger interest loop,' the 'driven loop for learning creation,' and the 'creator loop for learning habits' to meet the need of language proficiency of students in Chinese HEI institutions (Looi et al., 2023). The IDC pattern involves the implementation of innovative teaching activities, curriculum, and instructional design to stimulate lifelong learning (Sundqvist, 2022). Based on the objectives, the research questions are as follows.

A. What is an English course syllabus based on IDC in a Chinese college?
B. How can an IDC course be effectively applied to enhance Chinese college students' English proficiency?
C. Is Chinese college students' English proficiency better enhanced by an IDC intervention than that of students who are taught by traditional teaching methods?

Interest-driven Creator Theory

The strength of IDC highlights on student autonomy (Li & Liu, 2022). The key to establish the IDC (Wong et al., 2020) in this research is to define the longitudinal development of learning interest to habit from three perspectives. The IDC is typically focused on learners in China owning and performing their individual interests (Wong et al., 2020; Muhria, 2022). The three components of the IDC are explained below.

The interest loop is the first loop of the IDC. Learners' interest is characterised by certain action, including triggering, immersing, and extending (Jia et al., 2020). Based on these conditions, educators should not portray students' interests as a static theme, which requires a more in-depth investigation. Instead, they use an IDC instructional design to challenge student-based learning (Hashim et al., 2021). Students benefit and accumulate competency and skills with passion and curiosity when learning is fun and effective (Hwang et al., 2020). The IDC provides a solid and valid foundation for research and recommendations based on a growing interest in knowledge creation, the performance of problem-solving of complex tasks via habits, and the development of chronic interest-driven creators, specifically learners. (Cortese, 2022)

The driven creation loop is the second IDC loop, which entails learning practice, objectives, and procedures. Students' sense of accomplishment fosters their self-efficacy at this stage (Ma, 2022). The driven loop for learning creation (Nguyen et al., 2022) is related to learning productivity and the self-efficacy maintenance. During this loop, observation with elastic memory and understanding in learning (Torabi et al., 2019), which are essential to emphasise when observing that an unusual occurrence initiates the recreation process. Students should be free to emulate that occurrence and replicate the recreation process (Liu et al., 2018). When individuals have acquired extensive background knowledge, it is conceivable that they will develop a need to close the knowledge gap as seen in Fig. 1. From this perspective, imitation (Tangkaratt et al., 2020) is a means for next loop invention.

The creation for habit loop means the featured extension of previous loop on learners' habit, how the second loop should be integrated into the development of instructional objectives that can enhance the learning achievement. The creator loop for learning habits provides dynamic learning habits (Robinson et al., 2020) to lifelong learners with modern competencies or the skills needed for employment. This 'creator loop for learning habits' (Fiorella, 2020) involves minimal cost to develop or sustain social propensity in the established social context. Since individuals' learning behaviour shapes their performance, an upbeat personality would be formed in learning (Chan et al., 2019).

As methodical circulation, individuals' learning can predict their creative process as they progress steadily and consistently (Chen et al., 2020). These are the desired criteria for practicable interventions, as illustrated in Fig. 1. Learning habits (Marien et al., 2018) are generally formed in a psychological process that involves learners' cognitive capacities and affective states. Learners need an internal mechanism of continuous habit intervention to adapt to similar situations (Byrne, 2021). This mechanism is used to develop sustainable learning, prompt new and eventual actions and form the habit of learning.

English Listening, Speaking Competence

The listening competency (Xue et al., 2022) refers to learning outcomes based on interest, authentic resources, and positive beliefs from individuals on college students L2 listening. Thus, performance in L2 listening competency is influenced by how relevant or valuable L2 learners view L2 listening through linkage to practical training and resources. (Teo, 2019)

Since most Chinese college students at private universities are problematic (Lee et al., 2022), they compensate for expression deficiencies by acquiring a competent level of English speaking (Sun, 2022). Speaking competence provides the choice and arrangement of sounds in a language (Zhou, 2021), how usefully the sounds function in English, and what it means to be in the realm of English-speaking. English-speaking competence helps college students produce the correct and natural sounds (Meade, 2020).

Idc In Blended Setting (Bl) Settings

BL settings (Abugohar et al., 2019) integrated teaching and learning environments from traditional face-to-face instruction to online and digital learning pedagogy. It combines the strength of both traditional and online learning environments to enhance student English engagement, learning performance and academic achievement (Islam et al., 2022), such as flex blended setting. The specific flex BL settings (Athoillah, 2022; Faustino & Kaur, 2021; Yajie & Jumaat, 2023) established a learning environment in various activities weekly; students have a traditional classroom session to interact with their instructors and peers while also having online access such as online discussion and interactive peer review and feedback. The online session was asynchronous at weekends, where learners personalized their own pace and time. The instructor uses an online learning management system like WeChat, Dingtalks and

social media for completion checks. The instructor also assessed student learning outcomes using formative assessments like weekly class participation and summative assessments such as listening and speaking exams and assignments.

The IDC course design incorporates flex BL settings in pedagogical loops (Fig. 1), with learner-friendly mobile learning to increase students' interest and perception to assist them in learning English (Rahmawati, 2022), such as initial previewing and reviewing authentic video materials by interest; attending in-person listening and speaking sessions, then engaging in online sessions on the progressive content for learning creation; and then completing assignments and exams as learning outcomes as learning habits. Additionally, it included online and in-person note-taking to solve problems, extensive roleplay memes, and habitual reinforcement reflecting daily environmental activities via digital resources (Sholihah et al., 2021; Zhonggen et al., 2019) that were attached to the IDC. The quality of the flex settings will be sustained by performance evaluations (Hasan et al., 2022). Thus, a suitable measurement, such as CEFR, to assess flex blended setting outcomes (Solodka et al., 2022) is necessary for the IDC English course in this study.

These settings improve college students' problem-solving, rational, analytical, and critical thinking skills in English learning (Chowdhury, 2019). Their proficiency positively cross-promoted interests, integrating learning creation from interests and producing new learning techniques or habits (Cai & Chen, 2022). As for teachers, they can provide college students with fast, objective, and accurate feedback (Lim & Graham, 2021).

Methodology

The aim of this study is to develop an IDC English course via blended setting and to apply a quasi-experiment to verify that it improved Chinese students' English listening and speaking proficiency. A mixed-method approach was adopted that involved setting standardised tests and conducting semi-structured interviews at the research site from September to December 2022.

Participants

The experiment was conducted in Yunnan, China, and the participants consisted of 210 college students from six administrative classes. Their average age was 19 to 21, and there were 27 males and 183 females. Hence, the gender ratio was approximately 1.3:8.7. They were all in their first year of college. One hundred and six of them were assigned to the IDC-based English course intervention as the experimental group (EG), which the rest 104 were allocated to the control group (CG). These two groups took the regular English courses with different instructional approaches. The EG accepted the IDC-based training, while the CG's teaching was lecture-based.

Implementation Of Idc English Course

As the single intervention advanced, the sequence of the IDC intervention was developed into three phases with prolonged steps. The initial phase in the IDC: interest loop acted as a processor by contemplating questions such as what would the teacher or researcher require the college students to perform to spark their interest? How do the students remain immersed in their learning progress, and has this immersion been extended? What extracurricular materials and activities may be necessary?

The purpose of the first and second phases were to develop the students 'interest loop' and 'driven creation loop'. The second phase narrowed the first phase to sharing the interest targets in each course session with the 'learn, play, do model' (Salih, 2019; Zain, 2021; Zain et al., 2021). Then, the opportunities for the learners to participate in interest practice were enhanced by boosting their learning creation in language learning to form the driven loop. The college students generated the driven creation loop learning outcomes to connect the 'interest loop'; however, errors and flaws were tolerated at this stage to improve the learning experience in a mobile-assisted language learning setting (Alenezi, 2021; Chatterjee, 2022).

The purpose of the third phase was to improve the 'creation for learning habits loop' with rewards and feedback to acknowledge the college students' progress with appropriate learning habits. Then, based on their prior learning skills, the following course would be built for the college students to maximise their learning inventiveness and habit-forming triggers. As the final level of learning corresponds with their language learning skills, their habits are nourished to maturity in a cuing environment (Chan et al., 2019) in a blended language learning setting (Daniel, 2020). After the course, the college students could comprehend their overall performance, participate in a class discussion, provide feedback on the course, and express their appreciation throughout the semester to generate a 'creator loop for learning habit' (Taylor et al., 2021), as shown in Fig. 2

The design in Fig. 2. is valuable to the research questions and it is applicable to a similar and potential HEI context (Looi et al., 2023). Moreover, the quasi-experiment approach (Shannon-Baker, 2016; White & Sabarwal, 2014) enhances the internal and external validity of the research design. In this study, it also corresponded and was consistent with the course curriculum from December 2020 to September 2022. The trained teachers conducted the 16-week session procedure promptly and reported potential on-site issues of students' status or difficulties to the principal researcher.

Intervention

The IDC course in this study was designed based on expert reviews and finalised by settings from the literature (Wong et al., 2020). Since Chan et al. (2018) and Chan et al. (2019) suggest that courses should be tested on Chinese college students, the participants consisted of ESL/EFL college students from six administrative classes, divided into an experimental group (EG) and a control group (CG). The research processes and orientation (Amini Farsani et al., 2021) were undertaken to strengthen the study's learning objectives and outcome by proposing the IDC to solve the research problem. The course design covered learning interests, habits, and learning outcomes of the student learning experience. (Chen et al., 2019).

In the quasi-experimental design, the intervention among EG and CG students entailed utilising identical technological resources and mobile-assisted language learning (Nami, 2020) with each lesson in 1.5 hours, such as platforms like WeChat, Dingtalks, and SM. The active control was used to the CG with the aim of investigating progress in terms of the placebo effect (Chen & Chang, 2021). EG has IDC pedagogical settings and objectives for listening and speaking proficiency, presentation, roleplay, and teacher roles specified as facilitators, providers, and coordinators when students are active learners building interests and habits. CG has teachers-cantered roles and conventional blended setting for listening and speaking, including blended teaching, presentation, roleplay with the receivers, and passive learners' roles for students.

Data Collection And Analysis

English language proficiency test

Exam English, a tool for ESL/EFL language assessment based on the CEFR level, was used as the pre-test and post-test in this study. It describes the achievement of learners of foreign languages across countries. In addition, the A2 and B1 level listening and speaking exams were used as a pre-test and a post-test to evaluate both the EG and CG's English language progress before and after the intervention.

Listening test: the test lasts 30 minutes on-site with four sessions. College students finish their answers to the answer sheet. After completing all four sections with 25–30 multiple choice and fill-in blanks based on regular real-life conversation contexts, such as borrowing a book from a library or asking for academic help from peers and teachers. College students must correctly answer over 15 questions to reach the A2 level.

The speaking is 15 minutes of on-site tests, including three parts. The individual discusses specific topics before the examiner as realistically relevant to the real world, such as family or college life. The first consists of general questions about the respondent and recent status. Then 2 minutes of discussion on a particular subject related to fashionable or social issues. The third expanded the topic stated in the conversation in Part two. College students must reach the A2 level in three parts of the speaking test without significant pronunciation, vocabulary, and grammar mistakes.

Semi-structured interviews

Total of 16 students in the EG was invited to participate in an online semi-structured interview after the post-test in the fall semester of 2022. The qualitative tool investigated students' perspective for the dimension of IDC intervention, listening and speaking learning outcomes in 7 main questions. The anonymous expert reviews of the kappa results revealed that the values were all within 0.80 to 1. The interview questions were approved by eight professional practitioners with occupational experience of more than 15 years, from full-time instructors to administrative staff in the field of English in Chinese HEIs. The questions are shown as below.

1. Please describe your learning experience of the course this semester in 1 or 2 Keywords. 2. What is your anticipation for this course? Has it reached your anticipation? 3. How do you want to use the skills outside the classroom after learning this course? 4. What environment would you use the skills in? 5. What is your listening and speaking improvement from the course? 6. What learning habit do you have that actually works for you from this course? How helpful is it? 7. What further comments do you have for this course? Any content or form to improve the course?

Results

The 16-week semester began in September 2022 and ended in December 2022. The 210 students participated in the pre-and post-tests, and the outcomes were measured using online tests and interviews of listening and speaking outcomes. The data was subjected to a statistical analysis using independent t-tests, paired sample t-tests, ANCOVA and a qualitative analysis was conducted using Nvivo.

Quantitative Results

An independent sample t-test was initially applied to examine the learners' listening and speaking ability to gain insight into the detail of their performance. The means and standard deviations of the EG and CG based on the analytical results of the independent sample t-test are shown in Table 3. Two variables are highlighted, namely, listening and speaking learning outcomes. Exam English was used for the pre-test and post-test to examine the EG and CG students' listening and speaking proficiency at the beginning of the intervention to ascertain their progress in learning English in the quasi-experimental design.

The pre-test was focused on the students' listening and speaking learning outcomes. As shown by the above results, there was no significant difference between the EG (M = 134.170, SD = 8.152) and the CG (M = 131.632, SD = 3.742) in respect of listening, the EG (M = 134.624, SD = 9.601) and the CG (M = 136.603, SD = 5.313) in the speaking pre-test, thereby meeting the pre-test condition of homogeneity (p > .05) in the students' listening and speaking tests. This result meant that the EG and the CG remained at the same level as they did in the beginning in terms of listening and speaking on the A2 proficient level before the IDC intervention (Mishra et al., 2022).

Table 3
Results of Independent sample listening and speaking pre-test.

Variables	Tests	EG (n = 106)		CG (n = 104)		t	p
		M	SD	M	SD		
Listening	pre-test	134.170	8.152	131.632	3.742	0.611	0.511
Speaking	pre-test	134.621	9.601	136.603	5.313	0.432	0.519
Note. n = 210. EG = Experimental Group; CG = Control Group. *M* = Mean, *SD* = Standard Deviation.							

A paired-sample t-test was used to determine if there was a statistically significant difference in the growth of the students' learning outcomes before and after the IDC intervention, including their listening and speaking proficiency. The EG and CG results were analysed to determine if the difference between the pre-and post-test was positively significant. The expected results were used to determine the increase in the performance of students in the EG in the post-test from the pre-test rather than those in the CG after they finished the study (Marsden & Torgerson, 2012). The paired-sample test results for the EG students' listening and speaking ability in the pre-test and post-test are displayed in Table 4.

The mean and standard deviation of the EG's listening increased in the post-test compared to the pre-test. For instance, the results of the post-test ($M = 158$, $SD = 9.802$) had significantly increased to ($t = 20.877$, $p = .000 < .001$) compared to the pre-test. In terms of their speaking, the post-test score ($M = 157$, $SD = 10.887$) had increased significantly ($t = 20.536$, $p = .000 < .001$) from the pre-test score ($M = 135$, $SD = 10.543$), indicating the substantial growth (Marsden & Torgerson, 2012) of the EG's speaking proficiency after the IDC intervention.

Table 4
Results of paired-sample t-test of the EG's listening and speaking test

Variable	M (SD)	M (SD)	t
	Pre-test	Post-test	
Listening	134 (8.031)	158 (9.802)	20.877***
Speaking	135 (10.543)	157 (10.887)	20.536***

Note. $n = 106$. EG = Experimental Group. $p < .001$. M = Mean, SD = standard deviation.

Concerning the CG, the paired-sample t-test results of their listening showed a modest improvement from the pre-test ($M = 132$, $SD = 4.118$) to the post-test ($M = 140$, $SD = 6.134$). Still, it was statistically insignificant ($t = 2.960$, $p = .313$), suggesting that CG's listening skills made slow progress without the IDC intervention. No significant growth ($t = - 0.371$, $p = .467$) in their speaking in the post-test ($M = 137$, $SD = 7.008$), indicating rare growth (Marsden & Torgerson, 2012) in the CG's post-test speaking scores; therefore, the CG had made no progress in speaking without the IDC intervention.

Next, a one-way ANCOVA was used to determine if there were any statistically significant differences between the experimental and control groups in the post-test, controlling for the pre-test scores. The ANCOVA results showed that the IDC course intervention had improved the students' listening and speaking abilities. The ANCOVA results of their listening ($F = 685.132$, $p < .001$) and speaking ($F = 889.322$, $p < .001$) are shown in Table 5. These results were statistically significant and influential in size (Brydges, 2019).

The data as shown in Table 5 that the listening and speaking tests significantly affected both groups. Besides, it was found that the quasi-experimental design caused a significant increase in the listening

and speaking of both the EG and the CG.

Table 5
Results of one-way ANCOVA of the listening and speaking test.

Variable	Source	SS	df	MS	F	p
Listening	pre-test	2517.65	1	2517.65	285.130	.000
	Group	2876.47	1	2876.47	685.132	.000
	Error	3860.65	189	34.15		
	Total	13394.118	201			
Speaking	pre-test	3226.47	1	3226.47	848.863	.000
	Group	3576.84	1	3576.84	889.322	.000
	Error	3777.55	189	37. 94		
	Total	11063.235	201			
***p = .000 < .001						

As a result, the mean and standard deviation of the listening and speaking scores in the post-test are shown in Table 6 to demonstrate the influence of the pre-test's constraints on the post-test results. A significant difference was found in the post-test adjusted scores of the listening skills of the EG (M = 159.410, SD = 9.807) and CG (M = 143.533, SD = 7.644), with the results of the EG being higher than those of the CG. This was also evident in the post-test adjusted scores of the speaking of the EG (M = 160.726, SD = 8.857) and CG (M = 139.243, SD = 7.732). These results proved that the EG's listening and speaking abilities had significantly improved based on the post-test (p < .001) scores.

Table 6
Summary of one-way ANCOVA of the listening and speaking test.

Variable	Group	Adj. M	Adj. SD	n
Listening	EG	159.410	9.807	106
	CG	143.533	7.644	104
Speaking	EG	160.726	8.857	106
	CG	139.243	7.732	104
Note. n = 210. EG = Experimental Group; CG = Control Group. M = mean. SD = standard deviation.				

Finally, the EG's listening and speaking proficiency increased significantly more than the CG's based on the adjusted post-test scores through Table 7. The comparative results (Birgin & Uzun Yazc, 2021) above further illustrated that the IDC intervention had significantly improved the listening and speaking proficiency of the EG compared to the CG without the IDC intervention.

Qualitative Analysis

The main objective of the semi-structured interviews was thematic feedback (Bernard et al., 2016) on the IDC course impact on the student's perception of their listening and speaking proficiency. The interview questions covered the main dimensions of the research from the experts' reviews (Gumbheer et al., 2022). The specific components of the theme analysis were interest creation, driven to create learning, creation of learning habits for listening and speaking learning outcomes (Chen et al., 2020).

The first theme was an interest in listening and speaking learning outcomes to gather initial feedback on the expected behavioural benefit of the IDC course. Most interview participants suggested that individual students are responsible for clarifying their interests at the initial semester stage since the learning outcome is the core and foundation of their personal development throughout and after the semester. Hence, they considered that their interest should be naturally aroused when they were engaged in the IDC course to achieve listening progress.

Extract 1

I think interest is the best teacher, and if you don't have an interest in the course, you won't want to study it (listening), and if you're just into it, um, it's achieved. You love the course a lot, and then you get the urge to learn it (listening). Even if you have all sorts of difficulties, just remember this interest, and try, and then you will get support. (Participant 13, student, second interview)

The interview data suggested that maintaining and improving listening skills depends on the interest in learning the language. The interview data also showed that students increased their engagement in the IDC course to achieve listening progress and considered that interest should be a natural skill for responsible students.

The second theme was driven to creation (Chan et al., 2019), which entailed the growth of listening and speaking proficiency due to knowledge of reinforcement and feedback about creating anticipated behaviour (Elmahdi et al., 2018). Most interviewees reported that the effort to learn was a sustainable chain for their personal development throughout and after the semester.

The interview data proved that the blended course requirements (Burston & Arispe, 2022) supported appropriate learning creation (Chan et al., 2019). Individuals should devote themselves to learning resources and attempt to integrate mobile-assisted language learning based on preference (Burston & Giannakou, 2022; Yang, 2022) to achieve the learning outcomes of listening and speaking skills.

Extract 2

The key is to learn to create, I think. Because learning to create listening or speaking skills is through the teacher and the provision of resources, and then you have to solve your problems on your own; figure out

how to solve them using listening or speaking skill to express yourself. (Participant 15, student, second interview)

The interview data revealed that it is essential to invest adequate time and engagement in integrating the blended class content with blended setting materials that correspond to the learning objective, teacher support, and teaching resources with college life (Xu et al., 2022).

The last theme was the creation loop for learning habits (Chen et al., 2020). Most participants identified IDC nurturing their speaking and listening proficiency into practical and dynamic personal skills by reinforcing individuals' learning efforts into practice and self-efficacy in long-term habit-based learning (Kem, 2022).

The data demonstrated that learning habit following creation enables individuals to sustain their learning outcomes and self-efficacy (Roschelle & Burke, 2019). Learning creation loop prepares them for the habit of listening and speaking. It also supported the learning outcomes as individuals' expectation for development.

Extract 3

My key would be study habits. I can't say I'm not entirely interested. I'm still a little interested; for example, if I can speak fluently or hear properly, I'm still quite happy and have a sense of achievement, but I think it's more to do with study habits, because I'm a serious person and I strive for perfection. So every time I do the listening and speaking study, I focus on quality and quantity. (Participant 16, student, second interview)

The interview data illustrated that students' final progress toward listening and speaking as a habit depends on the teacher's support, class content and digital guidance (Nissim & Simon, 2020). This statement matches the IDC course design in terms of the role of the teacher in students' habits to become long-term learners. The above extract represents the EG's perspective after the intervention of the IDC course. Finally, the quantitative and qualitative results were combined to provide a comprehensive IDC course learning outcomes structure.

Discussion

To address research questions one, the English course syllabus during the 16-week experiment based on IDC in a Chinese college, the researcher found practical habit-based learning outcomes and students' feedback on teachers' support for self-efficacy, learning objectives, and other experiences using digital learning tools and resources in China. The students were encouraged to examine the progress they made when they endeavoured to be responsible for their own learning and to develop appropriate long-term aspirations for their particular goals from a proficient EFL perspective by the feedback on the curriculum. The EG feedback correlated with the findings of other researchers (Aguilar et al., 2022; Spada, 2022).

Aside from the blended setting, the IDC course with appropriate teacher support has become a significant mean to promote young talent to acquire adaptive self-learning skills that assists HEI students in an extracurricular context (Silva et al., 2018; Yasmin et al., 2019). The IDC English course curriculum for Chinese college students could reinvent, diversify, and encompass the current course objectives and procedures to increase college students' interest and learning outcomes. Hence, the learning creation (Chan et al., 2019) is the most significant feature that should be evaluated when determining the need for an IDC curriculum.

The answer to the second research question is that the IDC course effectively developed Chinese college students' English skills. HEI teachers should promote student-preferred policy and vary their teaching support to further integrate region-specific sustainability challenges in English course design for superior student learning outcomes (Mallillin & Caranguian, 2022). The English learning creation mastery of in IDC curriculum also connected the findings of empirical scholars (Purwanto & Hidayad, 2022; Razavipour, 2020), the outcome continued to investigate the observable inconsistency of individual learners' inadequate input, output, by providing necessary and interactive balance in a real-life context. The designed blended setting 'learn, play, do model' (An et al., 2020; Hermanto & Srimulyani, 2021) in IDC also supports a student learning mastery that, along with representing the real-life environment as cue solution should be recognised for enabling HEI students to master the English language by sharing and acknowledging the positive learning creation (Ross, 2020; Yuliati & Lestari, 2018). More IDC feature and research finding assembled Bourekkache & Kazar (2020) who concluded that teachers could provide students with support in the form of digital learning systems or platforms, so that the correlation between interest and English learning could continue to grow outside the classroom. Teachers' are responsible for digitally supporting students in selecting the systems or platforms for ease of use and the best learning outcomes. According to these findings, the IDC course matches the current planning concern to improve students' language proficiency.

In response to the third research question, an IDC intervention improved Chinese college students' English proficiency more than traditional teaching approaches. Once this learning approach (Roschelle & Burke, 2019) had been established and accompanied by learning creation, students' preferred teachers' support to be corrective feedback based on group activities and learning mastery representing daily routines rather than evaluation-based feedback (Eggers et al., 2021). In this sense, the IDC course design triggered learning interest as the foundation, then intensified and diversified learning creation, transferring to blended setting and eventually, with associative teacher support for learning habits strengthened the students' lifelong learning pattern (Elmahdi et al., 2018; Justiana et al., 2022). Chien et al. (2022) also predicted that traditional teaching methods might not be a fully considered option in the major wave of digital changes of policy in language learning and research because the traditional lecture pattern cannot educate long-term learning behaviour due to EFL learners' need for fast production and immediate consumption (Li & Lan, 2022). The IDC curriculum is based on real-life English exchanges of functional proficiency or daily English events that students may do naturally, alone or in small groups. Students are taught to sustainably harness English learning habits for lifelong purposes in this IDC course design. Their optimisation of these learning habits helps them to view their learning creations as valuable

vessels. Recent researchers (Jeong et al., 2021) have confirmed that a habit-establishing approach like IDC could bridge the neural mechanisms of language learning from social contexts (Hopp & Godfroid, 2023; Sadeghi, 2022).

Limitations

Instructional activities in China had to be undertaken both online and offline during the Covid-19 epidemic at the end of 2022. Students' learning environment was transformed, making external intervention or influence unavoidable. Morgan-Short et al. (2018) observed that the performance and assessment of students in online EFL classes may fluctuate more than in-campus EFL courses due to the continual distractions in learning sites, pressure concerns, and hardware glitches beyond teacher support. Some researchers (Dağgöl & Akçayoğlu, 2023; Yu, 2023) are also concerned that traditional face-to-face teacher-student interactions and debates with others may not be measured in online courses due to individual differences. Although students were expected to thoroughly engage in the course content and activities during the 16-week teaching period, some expected more teacher support and group discussions, and there were external communication challenges.

Conclusion

With the IDC course design in this study, students were able to choose the typical tactics and activities they preferred due to high flexibility and low anxiety, followed by personalised learning mastery. The study is consistent with those of current researchers (Gardner et al., 2022; Gambino & Share, 2023); therefore, learning creations in various contexts should be recognised and promoted by teacher support and relevant policy for students to achieve habit-based learning with the relevant, personalised learning outcomes.

The purpose of this study was to incorporate an IDC curriculum into English education to increase Chinese students' sustained listening, speaking proficiency. Students were guided to reorganise, reshape and reinforce their learning habits. They were able to execute brainstorming, problem-solving, hands-on inquiry, and habitual conversations in listening and speaking interactions, which they then integrated into the learning process and their extracurricular activities based on their interests and learning creation. (Ben et al., 2022)

Furthermore, it takes time and effort to mature or alter a conventional agreement in course design. Therefore, EFL teachers in HEI should collaborate to construct a course for the prospective combinations of English talents to fit their potential and developmental environment and ensure that their English is sufficiently proficient to be internationally competitive in their chosen profession. Interest is the best tutor for a given talent when shifting from content learning to methodological learning. (Panasyuk et al., 2022)

Implications

Theoretically, the IDC above established self-actualization needs involves the pursuit of a positive mind state, habit and talents, and the continual attempt to advance and upgrade oneself (Renninger & Hidi, 2022). It was a path understand the human intrinsic desire and relevant conduct, and personal improvement (Diwan & Vartanova, 2020; Setyosari & Cahyono, 2021). IDC has the ability to function in numerous domains, including HEI social psychology theme (Hernandez et al., 2023), digital behavior fields (Tang & Hew, 2022), skill enhancement in education service (Nantha, 2022), and individual self-help professional training (Mackett, 2022). The theory has been developed and broadened over time, but it remains a vital contribution to explaining the universal behavior and thought patterns of humans (Hashim et al., 2021; Muhria, 2022).

Practically, the design of English courses could be based on IDC principles and procedures to promptly accomplish innovation by developing a curriculum that has the objective of improving students' self-efficacy using blended setting. The IDC-related learning skills (Chan et al., 2018; Chan et al., 2019; Chen et al., 2020; Wong et al., 2020) are recommended for Chinese HEIs to achieve their lifelong educational goal. Sustainability research has begun to include digitalised lifetime learning in EFL and similar fields (Papageorgiou et al., 2022). Therefore, this IDC approach can also be extended to practical elective courses, competency-based competition training, and other specific national test competence development programmes (Orsini-Jones et al., 2022). However, HEI students have so far only been encouraged to apply curricular accomplishment in various subjects and the vital objective of EFL to extend the learning to extracurricular settings has been ignored (Ben et al., 2022). Since HEIs were required to promote the necessary English practice throughout China, the incorporation of the IDC into the English curriculum in this study can also apply to the relevant English curriculum for non-English major students (Yuliati & Lestari, 2018).

Declarations

Ethical Approval

Certificate of Exemption

Protocol Number: DPUHREC014/65NA

Office of the Dhurakij Pundit University Research Ethics Committee on Human (DPUREC)

The Human Research Ethics Committee, Dhurakij Pundit University, Thailand, has exempted the protocol based on Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

Competing interests

No potential conflict of interest was reported by the author(s).

Authors' contributions

Yongkang Wang is an Education Management PhD student at the Chinese international college, Dhurakij Pundit University, and a full-time teacher at a private college in Kunming, Yunnan, China. His research interests include second language acquisition education management in higher education and language teaching and learning.

Peng-Fei Chen is an assistant professor for the master's and doctoral programs in Education Management of Chinese International College at the Dhurakij Pundit University. She obtained a Ph.D. degree in human development and psychology from the University of London, Institute of Education. Her research interest is higher-order thinking, mental health, cross-cultural adaptation, sustainability, education management in higher education, and language teaching and learning.

Yongkang Wang wrote the main manuscript text under the guidance of Peng-Fei Chen.

All authors reviewed the manuscript.

Pengfei (Alice) Chen

https://orcid.org/0000-0001-6449-9865

Yongkang Wang

https://orcid.org/0009-0008-6715-6831

Funding

Availability of data and materials

Raw data for dataset of this research are not publicly available to preserve individuals' privacy under the protocol regulation of Office of the Dhurakij Pundit University Research Ethics Committee on Human (DPUREC).

References

1. Aguilar, J., Buendia, O., Pinto, A., & Gutiérrez, J. (2022). Social learning analytics for determining learning styles in a smart classroom. *Interactive Learning Environments*, *30*(2), 245–261. https://doi.org/10.1080/10494820.2019.1651745.
2. Alenezi, M. (2021). Deep dive into digital transformation in higher education institutions. *Education Sciences*, *11*(12), 770. https://doi.org/10.3390/educsci11120770.
3. Almazova, N., Krylova, E., Rubtsova, A., & Odinokaya, M. (2020). Challenges and opportunities for Russian higher education amid Covid-19: Teachers' perspective. *Education Sciences*, *10*(12), 368. https://doi.org/10.3390/educsci10120368.

4. Athoillah, U. (2022). The use of mobile assisted language learning (MALL) in teaching students' listening and speaking skills. *Jurnal Guru Dikmen dan Diksus*, *5*(1), 133–146. https://doi.org/10.47239/jgdd.v5i1.351.

5. Ben, Y., Dahmani, A., M., & Ragni, L. (2022). ICT use, digital skills and students' academic performance: exploring the digital divide. *Information*, *13*(3), 129. https://doi.org/10.3390/info13030129.

6. Bourekkache, S., & Kazar, O. (2020). Mobile and adaptive learning application for English language learning. *International Journal of Information and Communication Technology Education (IJICTE)*, *16*(2), 36–46. https://orcid.org/0000-0003-2038-6257

7. Burston, J., & Arispe, K. (2022). Experimental mobile assisted language learning research in SLA: Past, present, and future. In N, Ziegler & M, González-Lloret (Eds.), *The Routledge Handbook of Second Language Acquisition and Technology* (pp. 326–340). Routledge. https://doi.org/10.4324/9781351117586

8. Burston, J., & Giannakou, K. (2022). Mobile assisted language learning language learning outcomes: A comprehensive meta-analysis 1994–2019. *ReCALL*, *34*(2), 147–168. https://doi.org/10.1017/S0958344021000240.

9. Byrne, D. P., Goette, L., Martin, L. A., Delahey, L., Jones, A., Miles, A., & Tiefenbeck, V. (2021). The habit-forming effects of feedback: evidence from a large-scale field experiment. University of Bonn and University of Mannheim, Germany. *SSRN*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3974371

10. Chan, T. W., Looi, C. K., Chang, B., Chen, W., Wong, L. H., Wong, S. L., & Chou, C. Y. (2019). IDC theory: creation and the creation loop. *Research and Practice in Technology Enhanced Learning*, *14*(26), https://doi.org/10.1186/s41039-019-0120-5.

11. Chan, T. W., Looi, C. K., Chen, W., Wong, L. H., Chang, B., Liao, C. C. Y., et al. (2018). Interest-driven creator theory: towards a theory of learning design for Asia in the twenty-first century. *Journal of Computers in Education*, *5*(4), 435–461. https://doi.org/10.1007/s40692-018-0122-0.

12. Chatterjee, S. (2022). Computer assisted language learning (CALL) and mobile assisted language learning (MALL); Hefty tools for workplace English training: An empirical study. *International Journal of English Learning & Teaching Skills*, *4*(2), 1–7. https://doi.org/10.15864/ijelts.4212.

13. Chen, P., & Chang, Y. (2021). Enhancing creative problem solving in postgraduate courses of education management using project-based learning. *International Journal of Higher Education*, *10*(6), 11–21. https://doi.org/10.5430/ijhe.v10n6p11.

14. Chen, R., & Zou, M. (2018, December). Discussion on the relationship between exam-oriented education and quality-oriented education. In *2018 2nd International Conference on Education Innovation and Social Science (ICEISS 2018)* (pp. 350–353). Atlantis Press. https://www.atlantis-press.com/proceedings/iceiss-18/25907378

15. Chen, W., Chan, T. W., Wong, L. H., Looi, C. K., Liao, C. C., Cheng, H. N., & Pi, Z. (2020). IDC Theory: Habit and the habit loop. *Research and Practice in Technology Enhanced Learning*, *15*, 1–19.

https://doi.org/10.1186/s41039-020-00127-7.

16. Chien, T. C., Hung, H. C., Ku, Y. M., Wu, D. H., & Chan, T. W. (2022). Some thoughts on extending digital language learning research. *Bilingualism: Language and Cognition*, *25*(3), 384–385. https://doi.org/10.1017/S1366728921000821.

17. Chowdhury, F. (2019). Blended setting: How to flip the classroom at HEIs in Bangladesh? *Journal of Research in Innovative Teaching & Learning*, *13*(2), 228–242. https://emeraldinsight.com/2397-7604.htm.

18. Cortese, A. (2022). Metacognitive resources for adaptive learning. *Neuroscience Research*, *178*, 10–19. https://doi.org/10.1016/j.neures.2021.09.003.

19. Dağğöl, G. D., & Akçayoğlu, D. (2023). From emergency remote teaching to remote online education: challenges, benefits and differences in EFL setting. *Kastamonu Eğitim Dergisi*, *31*(1), 48–59. https://doi.org/10.24106/kefdergi.1243546.

20. Daniel, S. J. (2020). Education and the Covid-19 pandemic. *Prospects*, *49*, 91–96. https://doi.org/10.1007/s11125-020-09464-3.

21. Diwan, I., & Vartanova, I. (2020). Does education indoctrinate? *International Journal of Educational Development*, *78*, https://doi.org/10.1016/j.ijedudev.2020.102249. Article e102249.

22. Eggers, J. H., Oostdam, R., & Voogt, J. (2021). Self-regulation strategies in blended learning environments in higher education: A systematic review. *Australasian Journal of Educational Technology*, *37*(6), 175–192. https://doi.org/10.14742/ajet.6453.

23. Elmahdi, I., Al-Hattami, A., & Fawzi, H. (2018). Using technology for formative assessment to improve students' learning. *Turkish Online Journal of Educational Technology-TOJET*, *17*(2), 182–188. https://www.learntechlib.org/p/189651/.

24. Faustino, A., & Kaur, I. (2021, December). Blended setting Models: Perspectives' in Higher Education. In *International Joint Conference on Science and Engineering 2021 (IJCSE 2021)* (pp. 185–190). Atlantis Press. https://doi.org/10.2991/aer.k.211215.035

25. Fiorella, L. (2020). The science of habit and its implications for student learning and well-being. *Educational Psychology Review*, *32*(3), 603–625. https://doi.org/10.1007/s10648-020-09525-1.

26. Gambino, A., & Share, J. (2023). Critical media literacy and second language acquisition. http://doi.org/10.1016/b978-0-12-818630-5.07072-x

27. Gardner, B., Rebar, A. L., & Lally, P. (2022). How does habit form? Guidelines for tracking real-world habit formation. *Cogent Psychology*, *9*(1), 2041277. https://doi.org/10.1080/23311908.2022.2041277.

28. Ginaya, G., Rejeki, I. N. M., & Astuti, N. N. S. (2018). The effects of blended setting to students' speaking ability: A study of utilising technology to strengthen the conventional instruction. *International Journal of Linguistics Literature and Culture*, *4*(3), 1–14. http://doi.org/10.21744/ijllc.v0i0.000.

29. Gumbheer, C. P., Khedo, K. K., & Bungaleea, A. (2022). Personalised and adaptive context-aware mobile learning: review, challenges and future directions. *Education and Information Technologies*,

1–27. https://doi.org/10.1007/s10639-022-10942-8.

30. Hasan, K. K., Mostofa, S. M., Othman, R., & Mukherjee, D. (2022). Blended setting during pandemic through knowledge management: An analytical study. *Journal of Information & Knowledge Management*, *21*(Supp01), 2240006. https://doi.org/10.1142/S0219649222400068.

31. Hashim, S., Masek, A., Mahthir, B. N. S. M., Rashid, A. H. A., & Nincarean, D. (2021). Association of interest, attitude and learning habit in mathematics learning towards enhancing students' achievement. *Indonesian Journal of Science and Technology*, *6*(1), 113–122. https://doi.org/10.17509/ijost.v6i1.31526.

32. Hernandez, P. R., Ferguson, C. F., Pedersen, R., Richards-Babb, M., Quedado, K., & Shook, N. J. (2023). Research apprenticeship training promotes faculty-student psychological similarity and high-quality mentoring: a longitudinal quasi-experiment. *Mentoring & Tutoring: Partnership in Learning*, *31*(1), 1–21. https://doi.org/10.1080/13611267.2023.2164973.

33. Hopp, H., & Godfroid, A. (2023). Introduction: Second language acquisition and psycholinguistics. *The Routledge Handbook of Second Language Acquisition and Psycholinguistics* (pp. 1–9). Routledge.

34. Hwang, G. J., Sung, H. Y., Chang, S. C., & Huang, X. C. (2020). A fuzzy expert system-based adaptive learning approach to improving students' learning performances by considering affective and cognitive factors. *Computers and Education: Artificial Intelligence*, *1*, 100003. https://doi.org/10.1016/j.caeai.2020.100003.

35. Islam, M. K., Sarker, M. F. H., & Islam, M. S. (2022). Promoting student-centred blended setting in higher education: A model. *E-Learning and Digital Media*, *19*(1), 36–54. https://doi.org/10.1177/20427530211027721.

36. Jeong, K. O. (2022). Facilitating sustainable self-directed learning experience with the use of mobile-assisted language learning. *Sustainability*, *14*(5), 1–13. https://doi.org/10.3390/su14052894.

37. Jia, C., Yang, T., Qian, Y., & Wu, X. (2020). The gender differences in science achievement, interest, habit, and creativity. *Science Education International*, *31*(2), 195–202. https://doi.org/10.33828/sei.v31.i2.9.

38. Justiana, P. P, Santosa, M. H., & Mahendrayana, G. (2022). English teachers and students readiness in utilizing mobile assisted language learning in English distance learning context. *Eltin Journal: Journal of English Language Teaching in Indonesia*, *10*(2), 103–112. https://e-journal.stkipsiliwangi.ac.id/index.php/eltin/article/view/2726/1409.

39. Kem, D. (2022). Personalised and adaptive learning: Emerging learning platforms in the era of digital and smart learning. *International Journal of Social Science and Human Research*, *5*(2), 385–391. https://doi.org/10.47191/ijsshr/v5-i2-02.

40. Lee, N. A. A., Kassim, A. A. M., & Bakar, R. A. (2022). The CEFR-Aligned Curriculum Execution in Malaysia and Other Countries: A Conceptual Paper. *Malaysian Journal of ELT Research*, *19*(1), 1–15. https://doi/org/10.52696/TGCT6849.

41. Li, C., & Liu, H. (2022). Analysis on college students' extracurricular learning interests based on their book borrowing behaviours. *International Journal of Emerging Technologies in Learning*, *17*(5). https://doi.org.10.3991/ijet.v17i05.29853

42. Li, J. (2021). Mobile-assisted autonomous English learning in college students' extra-curriculum time: A case study in China. *Technium Soc Sci J*, *19*, 129–143. https://www.techniumscience.com/index.php/socialsciences/article/view/2616.

43. Li, P., & Lan, Y. J. (2022). Digital language learning (DLL): Insights from behavior, cognition, and the brain. *Bilingualism: Language and Cognition*, *25*(3), 361–378. https://doi.org/10.1017/S1366728921000353.

44. Lim, C. P., & Graham, C. R. (Eds.). (2021). *Blended setting for inclusive and quality higher education in Asia*. Springer Singapore. https://doi.org/10.1007/978-981-33-4106-7.

45. Liu, Y., Gupta, A., Abbeel, P., & Levine, S. (2018). Imitation from observation: Learning to imitate behaviors from raw video via context translation. In *2018 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 1118–1125). IEEE. https://eecs.berkeley.edu/Pubs/TechRpts/2018/EECS-2018-37.html

46. Looi, C. K., Wong, S. L., Kong, S. C., Chan, T. W., Shih, J. L., Chang, B., & Liao, C. C. (2023). Interest-driven creator theory: Case study of embodiment in an experimental school in Taiwan. *Research and Practice in Technology Enhanced Learning*, *18*, 1–34. https://doi.org/10.58459/rptel.2023.18023.

47. Ma, Y. (2022). The effect of teachers' self-efficacy and creativity on English as a Foreign language learners' academic achievement. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/ffpsyg.2022.872147

48. Mackett, R. L. (2022). Gender, mental health and travel. *Transportation*, *49*(6), 1891–1920. https://doi.org/10.1007/s11116-021-10231-2.

49. Mallillin, L. L. D., & Caranguian, R. G. (2022). Purposive communication learning competency of general education subject of students in private higher education institution (HEI). *European Journal of Education Studies*, *9*(11), https://doi.org/10.46827/ejes.v9i11.4552.

50. Marien, H., Custers, R., & Aarts, H. (2018). Understanding the formation of human habits: an analysis of mechanisms of habitual behaviour. *The Psychology of Habit* (pp. 51–69). Cham: Springer. https://link.springer.com/chapter/ 10.1007/978-3-319-97529-0_4.

51. Marsden, E., & Torgerson, C. J. (2012). Single group, pre-and post-test research designs: Some methodological concerns. *Oxford Review of Education*, *38*(5), 583–616. http://doi.org/10.1080/03054985.2012.731208.

52. Meade, G. (2020). The role of phonology during visual word learning in adults: An integrative review. *Psychonomic Bulletin & Review*, *27*(1), 15–23. https://doi.org/10.3758/s13423-019-01647-0.

53. Morgan-Short, K., Marsden, E., Heil, J., Ii, I., Leow, B. I., Mikhaylova, R. P., & Szudarski, A., P (2018). Multisite replication in second language acquisition research: Attention to form during listening and reading comprehension. *Language Learning*, *68*(2), 392–437. https://doi.org/10.1111/lang.12292.

54. Muhria, L. (2022). The Use of BL model to enhance student's learning interest in English. *Journal of English Language Learning*, *6*(1), 107–114. https://doi.org/10.31949/jell.v6i1.2745.

55. Nami, F. (2020). Towards more effective app-assisted language learning: The essential content and design features of educational applications. *Issues in Language Teaching*, *9*(1), 245–278. https://doi.org/245-278.10.22054/ILT.2020.52777.501

56. Nantha, C. (2022). A quasi-experimental evaluation of classes using traditional methods, problem-based learning, and flipped learning to enhance Thai student-teacher problem-solving skills and academic achievement. *International Journal of Emerging Technologies in Learning (Online)*, *17*(14), 20–38. https://doi.org/10.3991/ijet.v17i14.30903.

57. Nguyen, T. T., Nguyen, C. M., Nguyen, D. T., Nguyen, D. T., & Nahavandi, S. (2022). Deep learning for deepfakes creation and detection. *Computer Vision and Image Understanding*, *223*, 103525. https://doi.org/10.1016/j.cviu.2022.103525.

58. Nissim, Y., & Simon, E. (2020). Agility in teacher training: distance learning during the Covid-19 pandemic. *International Education Studies*, *13*(12), https://doi.org/10.5539/ies.v13n12p11.

59. Orsini-Jones, M., Cerveró-Carrascosa, A., & Finardi, K. R. (2022). A "Glocal" community of practice to support international ELT (English Language Teaching) students in the UK: Project BMELTET. In C. Smith & G. Zhou (Eds.), *Handbook of Research on Teaching Strategies for Culturally and Linguistically Diverse International Students* (pp. 306–325). IGI Global. https://pureportal.coventry.ac.uk/en/publications/a-glocal-community-of-practice-to-support-international-elt-engli

60. Panasyuk, V. P., Achkasova, O. G., Alexandrova, N. V., Migunova, E. V., & Zhigalik, M. A. (2022, February). The role of university additional professional education in regional ecosystem development. In *International Scientific and Practical Conference Strategy of Development of Regional Ecosystems "Education-Science-Industry"(ISPCR 2021)* (pp. 358–362). Atlantis Press.

61. Papageorgiou, S., Wu, S., Hsieh, C. N., Tannenbaum, R. J., & Cheng, M. (2022). Yu yan ce shi cheng ji yu dang di neng li deng ji dui jie yan jiu: Yi Zhong guoying yu neng li deng ji liang biao (CSE) wei li [A study on the alignment of English test scores with local proficiency levels: the example of the Chinese scale of English proficiency (CSE)]. *Chinese/English Journal of Educational Measurement and Evaluation*, *3*(1), 18–33. https://www.ce-jeme.org/journal/vol3/iss1/2.

62. Pelletier, K., Brown, M., Brooks, D. C., McCormack, M., Reeves, J., Arbino, N., & Mondelli, V. (2021). 2021 EDUCAUSE Horizon Report Teaching and Learning Edition. https://library.educause.edu/-/media/files/library/2021/4/2021hrteachinglearning.pdf

63. Rahmawati, F. (2022). Investigating EFL teachers' approaches to meaningful learning in blended-learning listening and speaking courses. *Indonesian EFL Journal*, *8*(1), 91–104. https://doi.org/10.25134/ieflj.v8i1.5602.

64. Renninger, K. A., & Hidi, S. E. (2022). Interest development, self-related information processing, and practice. *Theory into Practice*, *61*(1), 23–34. https://doi.org/10.1080/00405841.2021.1932159.

65. Robinson, C., Phillips, L., & Quennerstedt, A. (2020). Human rights education: developing a theoretical understanding of teachers' responsibilities. *Educational Review*, *72*(2), 220–241. https://doi.org/10.1080/00131911.2018.1495182.

66. Roschelle, J., & Burke, Q. (2019). Commentary on Interest-driven creator theory: A US perspective on fostering interest, creativity, and habit in school. *Research and Practice in Technology Enhanced Learning*, *14*(1), 1–8. https://doi.org/10.1186/s41039-019-0107-2.

67. Sadeghi, K. (2022). Digital technology and EFL: An interview with Glenn Stockwell. *Talking About Second Language Acquisition* (pp. 245–266). Cham: Springer International Publishing. http://doi.org/10.1007/978-3-030-99758-8_15.

68. Salih, A. H. (2019). Effects of MALL on developing listening skill to the department of English students in college of education for women at Al Iraqi University. *European Journal of Language and Literature*, *5*(1), 31. https://doi.org/10.26417/ejls-2019.v5i1-191.

69. Setyosari, P., & Cahyono, B. Y. (2021). Learning character base learners in Indonesia (Series two: Research on English phonology learning models). *Review of International Geographical Education Online*, *11*(3), 864–874. https://doi.org/10.33403/rigeo.800534.

70. Shannon-Baker, P. (2016). Making paradigms meaningful in mixed methods research. *Journal of Mixed Methods Research*, *10*(4), 319–334. https://doi.org/10.1177/15586898155758.

71. Sholihah, H. I., Hidayat, A. W., Srinawati, W., Syakhrani, A. W., & Khasanah, K. (2021). What linguistics advice on teaching English as a foreign language learning using blended setting system. *Linguistics and Culture Review*, *5*(1), 342–351. https://doi.org/10.37028/lingcure.v5n1.1620.

72. Silva, R., Rodrigues, R., & Leal, C. (2018). Academic Motivation Scale: development, application and validation for Portuguese accounting and marketing undergraduate students. *International Journal of Business and Management*, *13*(11), 1–16. https://doi.org/10.5539/ijbm.v13n11p1.

73. Solodka, A., Ruskulis, L., Demianenko, O., & Zaskaleta, S. (2022). Mobile assisted language learning instructional course design: constructing out-of-class experience. *Arab World English Journal Anglistik*, *33*(1), https://doi.org/10.24093/awej/call8.3.

74. Spada, N. (2022). EFL research and L2 pedagogy: An uneasy relationship. In C. Bardel, C. Hedman, K. Rejman, & E. Zetterholm (Eds.), *Exploring Language Education: Global and Local Perspectives* (pp. 13–37). Stockholm University Press. https://doi.org/10.16993/bbz.b.

75. Sundqvist, P. (2022). Learning across the lifespan: Age, language learning, and technology. In *The Routledge Handbook of Second Language Acquisition and Technology*. Taylor & Francis. https://doi.org/10.4324/9781351117586-30

76. Tan, S., Liu, Z., Liu, S., Su, Z., Chai, H., & Liu, S. (2020). Investigating the relationship among students' interest, flow and their learning outcomes in a blended setting asynchronous forum. In *CSEDU (2)* (pp. 34–41). https://doi.org/10.5220/0009339300340041

77. Tangkaratt, V., Han, B., Khan, M. E., & Sugiyama, M. (2020, November). Variational imitation learning with diverse-quality demonstrations. In *International Conference on Machine Learning* (pp. 9407–9417). PMLR. https://proceedings.mlr.press/v119/tangkaratt20a.html

78. Taylor, D. L., Yeung, M., & Bashet, A. Z. (2021). Personalised and Adaptive Learning. *Innovative Learning Environments in STEM Higher Education* (pp. 17–34). Cham: Springer. https://doi.org/10.1007/978-3-030-58948-6_2.

79. Teo, T. (2019). Students and teachers' intention to use technology: Assessing their measurement equivalence and structural invariance. *Journal of Educational Computing Research*, *57*(1), 201–225. https://doi.org/10.1177/0735633117749430.

80. Torabi, F., Warnell, G., & Stone, P. (2019). Recent advances in imitation learning from observation. *arXiv preprint arXiv:1905.* 13566. https://doi.org/10.48550/arXiv.1905.13566

81. White, H., & Sabarwal, S. (2014). Quasi-experimental design and methods. *Methodological Briefs: Impact Evaluation*, *8*(2014), 1–16. https://www.researchgate.net/profile/Sharanbasappa-Durg/post/Can_a_quasi-experimental_design_be_retrospective/Brief_8_quasiexperimental+design_eng.pdf

82. Wong, L. H., Chan, T. W., Chen, W., Looi, C. K., Chen, Z. H., Liao, C. C., & Wong, S. L. (2020). IDC theory: interest and the interest loop. *Research and Practice in Technology Enhanced Learning*, *15*(1), 1–16. https://doi.org/1-16.

83. Xie, H., Chu, H. C., Hwang, G. J., & Wang, C. C. (2019). Trends and development in technology-enhanced adaptive/personalised learning: A systematic review of journal publications from 2007 to 2017. *Computers & Education*, *140*, 103599. https://doi.org/10.1016/j.compedu.2019.103599.

84. Xing, D., & Bolden, B. (2019). Exploring oral English learning motivation in Chinese international students with low oral English proficiency. *Journal of International Students*, *9*(3), 834–855. https://doi.org/10.32674/jis.v9i3.749.

85. Xue, M., Saffari, N., & Motevalli, S. (2022). English for specific purposes research and practice in the past 20 years (2001–2020) in China: A literature review. *English Language Teaching*, *15*(8), 1–13. https://doi.org/10.5539/elt.v15n8p13.

86. Yajie, C., & Jumaat, N. F. B. (2023). Blended setting design of English language course in higher education: A systematic review. *International Journal of Information and Education Technology*, *13*(2), https://doi.org/10.18178/ijiet.2023.13.2.1815.

87. Yang, S. (2022). A digital future of diversity, connectivity, and sustainability: critical review of MALL in CSL/CFL education (2013–2021). *Applying Mobile Technologies to Chinese Language Learning*, *67–89.* https://doi.org/10.4018/978-1-7998-4876-9.ch003

88. Yu, L. T. (2023). A Comparison of the Autonomous Use of Technology for Language Learning for EFL University Students of Different Proficiency Levels. *Sustainability*, *15*(1), 606. https://doi.org/10.3390/su15010606.

89. Yuliati, S. R., & Lestari, I. (2018). Higher-order thinking skills (HOTS) analysis of students in solving hots question in higher education. *Perspektif Ilmu Pendidikan*, *32*(2), 181–188. https://doi.org/10.21009/PIP.322.10.

90. Zain, D. S. M., & Bowles, F. A. (2021). Mobile-assisted language learning (MALL) for higher education instructional practices in EFL/ESL contexts: A recent review of literature. *Computer Assisted*

Language Learning Electronic Journal, *22*(1), 282–307. http://callej.org/journal/22-1/Zain-Bowles2021.pdf.

91. Zain, S. (2021). Digital transformation trends in education. In D. Baker & L. Ellis (Eds.), *Future Directions in Digital Information* (pp. 223–234). Chandos Publishing. https://doi.org/10.1016/B978-0-12-822144-0.00036-7

92. Zhonggen, Y., Ying, Z., Zhichun, Y., & Wentao, C. (2019). Student satisfaction, learning outcomes, and cognitive loads with a mobile learning platform. *Computer Assisted Language Learning*, *32*(4), 323–341. https://doi.org/10.1080/09588221.2018.1517093.

93. Zhou, Z. (2021). A systematic literature review on the use of Mobile-assisted Language Learning (mobile assisted language learning) for Enhancing speaking skills in Chinese EFL context. *International Journal of Frontiers in Sociology*, *3*(15), https://doi.org/10.25236/IJFS.2021.031502.
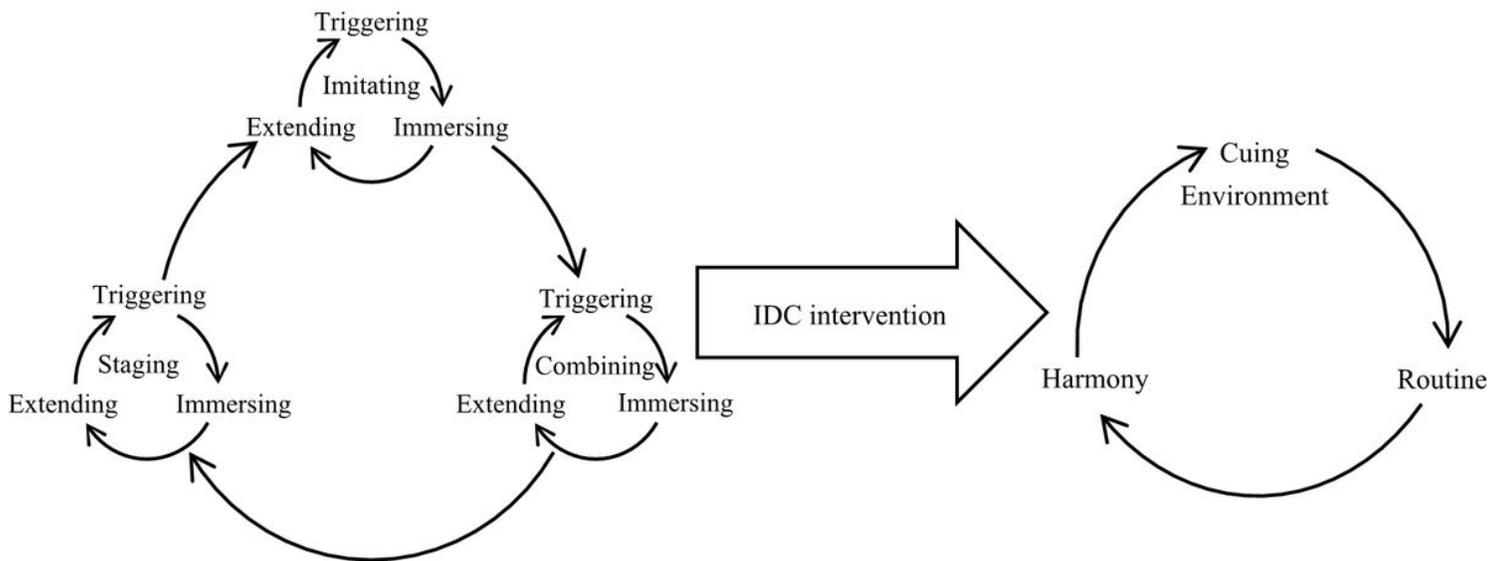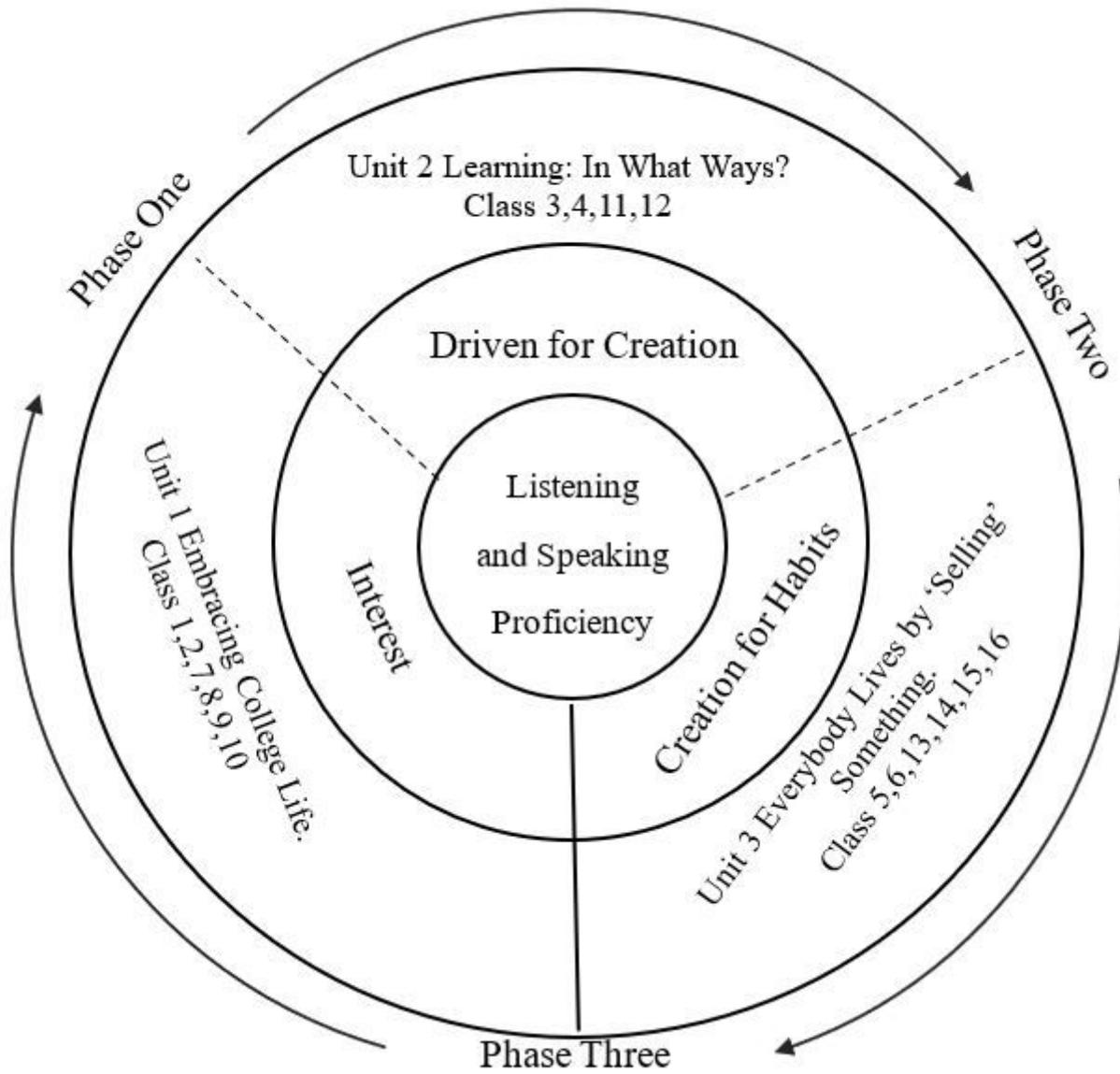
Figures

Figure 1

IDC learning pattern.

Figure 2

IDC course design in Semester 2022