Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

AicQoL2023Bangkok

https://www.amerabra.org

e-IPH e-International Publishing House Ltd., United Kingdom

11th AMER International Conference on Quality of Life
Al Meroz Hotel, Bangkok, Thailand 28-30 Apr 2023

Student Learning Engagement with Emerging Technologies in the EFL Classroom in China: A case study

Min Fan[1], Gurnam Kaur Sidhu[2]*, Melanie Khor[2], Huaying Jiang[1]
** Corresponding Author*

[1] School of Foreign Languages, Sichuan University of Science & Engineering, Huxing Road, Ziliujing District, Zigong City, Sichuan Provenience, China, [2] Faculty of Education, Languages, Psychology and Music, SEGi University, Kota Damansara, Petaling Jaya, Malaysia.

fanminsegi@163.com, gurnamgurdial@segi.edu.my, melaniekhorweichen@gmail.com, 362407968@qq.com
+60361452777 (Ext 3218)

Abstract
This study investigated learner engagement with emerging technologies as a viable teaching and learning tool. This explorative study was conducted in a public university located in Sichuan Province, China involving 160 sophomore students. Data were collected via a questionnaire consisting of open and close-ended questions. The findings revealed that EFL students frequently used Tencent as the preferred platform for online distance learning. Besides that, the findings demonstrated students' positive perception of learner-to-learner, learner-to-instructor, and learner-to-content interaction through the support of emerging technologies. Thus, it implies that emerging technologies have the potential to boost a quality learning environment.

Keywords: EFL students, learner engagement, emerging technologies

DOI: https://doi.org/10.21834/ebpj.v8i24.4652

1.0 Introduction

Today's 21st-century classrooms have witnessed a whole paradigm shift in terms of the teaching and learning environment. There is no denying that the unprecedented outbreak of the global Covid-19 pandemic has been a catalyst for emerging technologies in almost all classrooms worldwide (Sidhu, Chen, Shamida, & Wen, 2022). As we step into the post-pandemic era, the learning environment in classrooms has continued to embrace emerging technologies. The benefits are countless as technology today not only facilitates student learning gains but, more importantly, technologies such as search engines in the World Wide Web (WWW), e-books and massive open online courses bring together a wealth of resources from all four corners of the world to serve us at the click of a mouse.

The 21st-century learners can only reap the optimum benefits of emerging technologies if they are engaged and understand the dominant language employed by the WWW, i.e., English. Realising the importance of English as a fast-growing international language for communication, trade, commerce and information, most countries have embraced English either as a second language (ESL) or English as a foreign language (EFL) in their educational system.

In China, almost all educational institutions have adopted English as a foreign language (EFL) for the past few decades. Yet studies by Hu, Sidhu and Lu (2022) have shown that student performance has been rather disappointing as students face several challenges having to learn a foreign language in a homogenous learning environment where everyone speaks Chinese. With limited opportunities for EFL Chinese students to speak and practice the language in and out of their EFL classrooms, it is perhaps timely that Chinese

eISSN: 2398-4287 © 2023. The Authors. Published for AMER & cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia..
DOI: https://doi.org/10.21834/ebpj.v8i24.4652

students and teachers utilise emerging technologies such as artificial intelligence, virtual reality, and augmented reality to enable more realistic, engaging and innovative teaching methodologies to enhance EFL students' learning gains. There is no denying that though these emerging technologies can help both teachers and students to maintain a relatively stable ecological EFL learning environment, what is more, important is that students must be engaged in emerging technologies to aid their learning endeavours.

Yet the question that begs to be answered is to what extent are EFL Chinese learners embracing and engaging with the emerging technologies available for language learning. Therefore, this exploratory study aimed to examine tertiary students' learning engagement with emerging technologies in EFL classrooms in China. In this study, "emerging technologies" refer to technological platforms and tools that have been embraced in the teaching and learning process over the last decade (2000-2022).

2.0 Literature Review

A quality learning environment is essential because it creates a conducive classroom for educators to work productively in an environment focused on learning. One of the main criteria for creating a quality learning environment is engagement. Engagement is often seen as the adhesive in holding all characteristics of student learning and growth. The following sections discuss learner engagement and emerging technologies which supports the notion of a quality learning environment.

2.1 Learner Engagement

Learner engagement is a multi-dimensional and complex phenomenon to comprehend; despite that, it is considered a critical facet in supporting the development of teaching and learning. The concept of learner engagement can be viewed through the lens of Moore's perspective in identifying three types of interaction inherent in effective online distance learning or online courses in general. The types of interaction are learner-to-learner interaction, learner-to-instructor interaction and learner-to-content interaction.

Learner-to-learner interaction refers to the interaction that occurs between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor (Moore, 1989). The learner-to-learner interaction plays a pivotal role in online learning because it leads to high learning engagement and improved satisfaction, as reported by various studies (Oyarzun, Stefaniak, Bol, & Morrison, 2018) (Van Batenburg, Oostdam, Van Gelderen, Fukkink, & De Jong, 2019). This is likely because students are motivated to learn when they are in a group as they no longer feel isolated and benefit from peer feedback.

Learner-to-instructor interaction refers to the interaction between the learner and the expert who prepared the subject material or some other expert acting as the instructor. Swan (2003) posits that in the learner-to-instructor interaction, the instructor attempts to stimulate student interest in the course content, motivate the student, and facilitate the learning process. In fact, Shackelford and Maxwell (2012) quantitatively examine which types of learner-to-instructor interactions contribute most to the development of student's sense of community in online education and reported that instructor modelling, support and encouragement and facilitating discussions were the main contribution. Thus, it can be implied that good rapport between learners and instructor is important for learner engagement (Shackelford & Maxwell, 2012).

Besides that, it is equally important to create activities that enhance engagement in online distance learning. M. G. Moore (1989) locates the learner-to-content interaction as the heart of all learning experiences. The learner-to-content interaction refers to the process of intellectually interacting with some form of text or artefact (an article, audio recording, slides from a presentation, etc.), which can facilitate learners' understanding of a subject matter. Some common learner-to-content interaction for online education includes assigned readings (textbooks, articles, primary sources, etc.), transcript of lectures, narrated PowerPoint presentations, illustrative images, embedded or linked multimedia content (such as films, YouTube videos, podcasts, etc.), research assignments, and content sharing between learners such as group discussions or group projects. In order to enhance engagement that leads to valuable learning experiences, the learner-to-content interaction,n as suggested by Tualaulelei, Burke, Fanshawe and Cameron (2022), asserts that online content should be useful, desirable, accessible, credible, findable and usable for learners.

2.2 Emerging Technologies

During the COVID-19 pandemic, digital technology enabled educators to continue teaching during lockdowns and social distancing requirements. Even as the world progresses towards the post-pandemic era, the shift towards remote teaching has remained, and as a result, educators have incorporated emerging technologies as part of the education experience (Wood, 2022). Likewise, the Chinese government had issued the national policy of "Suspending classes without Stopping Learning" to ensure the continuity of teaching and learning during the pandemic (Yanjun, Luan, Md., Nooreen, & Jingxin, 2022) . This is achieved through the use of online technological tools and platforms in a bid to overcome the challenges of social distancing and home quarantine.

Generally, distance learning or remote learning involves a plethora of technologies, such as synchronous communication tools (course delivery platforms and social media), asynchronous platforms for collaboration and online electronic resources (Li, 2022). Specifically in the context of China, EFL teachers mostly use platforms such as Ding Talk, Cidaren, We Learn, WeChat, Chaoxing, Tencet Classroom, Tencent Document, Moodle, Eduyun and Massive Open Online Courses (MOOC) to conduct teaching and learning (Goa et al., 2022). In addition to that, Juan (2020) found that live streaming, video-recorded learning and independent learning with materials distributed by teachers were common modes of learning.

In a wider context, other learning management systems such as Google Classroom, ClassDojo, Schoology, Edmodo, Paper Plane and EkStep were also utilised for remote learning. On the other hand, video conferencing platforms such as Zoom, Microsoft, Teams, Google Meet/Hangouts, Skype and Cisco WebEx were mainly used as a substitute to mimic the teaching and learning of a physical classroom.

The widespread utilisation of technology has prompted numerous investigations into the impact of online learning. According to Han, Geng and Wang's (2021) research, EFL learners exhibited a favourable attitude towards virtual learning environments. Teng and Wang (2021) conducted a study that examined the impact of Xuexitong, a learning management system, and WeChat, a social networking system, on student engagement. The study found that these technologies had a positive effect on student engagement, particularly in terms of emotional engagement. Nonetheless, there are reservations regarding the utilisation of technologies. The study conducted by Li, Sun and Jee (2019) aimed to compare the level of teacher-student interaction in elementary English EFL classrooms with technological integration. The study revealed that the impact of technology on teacher feedback patterns was comparatively minimal. Based on the discussion above, it can be implied that today's quality learning environment involves active learner engagement with the support of emerging technologies. Therefore, the aim of this study was to examine EFL Chinese students learning engagement with emerging technologies to enhance their language learning process in a public university in China. More specifically, the study was guided by the following research objectives:

- To determine the most frequently used learning platforms by the EFL tertiary Chinese students in University X.
- To examine EFL students' perspectives of emerging technologies as a viable teaching and learning tool.
- To investigate students' perceptions of emerging technologies with regard to learner-learner interaction, learner-instructor interaction and learner-content interaction.
- To explore how emerging technologies have enhanced EFL students' online learning experience.

3.0 Methodology

3.1 This exploratory study employed a quantitative research design wherein data were collected via a survey questionnaire to determine students' learning engagement with emerging technologies for EFL. It was also a case study because it aimed to gain an in-depth understanding of student engagement with technologies in the context of EFL (Amin & Zulfitri, 2022). The study was set in one public university in the Sichuan province in China. It involved a population of 160 EFL sophomore students from three randomly selected faculties. The study involved only second-year EFL students because the researchers felt that first-year students were new and probably still getting to understand university life. On the other hand, a majority of the final year students do not need to take English language courses.

3.2 Data for the study were collected via a survey questionnaire examining students' perspectives of their engagement with emerging technologies, including the following aspects: types of technologies such as live streaming, social media platforms, learning management platforms and learning platforms often used in China such as Tencent, Xuexitong and Dingding classroom. They are often used in the learning process. Learner engagement with technology was based on three main constructs, i.e., learner-to-learner engagement, learner-to-instructor engagement and learner-to-content engagement. Respondents were required to respond based on a six-point Likert scale ranging from strongly disagree (1) to strongly agree (6). The face and content validity of the questionnaire was validated by two professors, whilst the reliability was established via comparing the amount of shared variance, which revealed an overall Cronbach Alpha score of 0.998, indicating that the questionnaire was highly reliable. The quantitative data were analysed using both descriptive and inferential statistical measures.

3.3 Keeping in line with ethics in research, permission was obtained from the institution concerned, and all respondents of the study were provided with consent forms and were given the assurance that they could withdraw from the study at any time they felt uncomfortable answering any question in the questionnaire. All data were kept private and confidential and stored on a laptop which could only be accessed by the researchers.

4.0 **Findings**

A total of 160 sophomore students participated in the study, which majority of the students were from the faculty of science and technology (54.38%), followed by the faculty of humanities and social science (31.88%) and the faculty of business and management (13.75%). A majority of the respondents spent one to two hours in online distance learning every day (41.25%), while some reported that they spent less than one hour (31.25%), and a minority of respondents reported that they spent an average of seven to fifteen hours in online distance learning (5.63%).

4.1 Platforms Used in Online Distance Learning

Based on Figure 1, it can be seen that out of the 160 respondents, a large majority (87.5%) of the respondents used Tencent Meeting as the platform for online distance learning. This learning platform was one of the main learning platforms used in China during the pandemic and has continued to be a choice of platform for learning among a large majority of learners. In the open-ended questions, respondents highlighted that the Tencent Meeting was reliable, easy-to-use and rather secure as it provided cloud-based high-definition video conferencing for learners. The second most frequently utilised platform was Xuexitong (97) and Dingding Classroom (92),

respectively. Meanwhile, a minority of the respondents used Coursera (3), Weibo (3) and personal website (2) as the online distance learning platform.

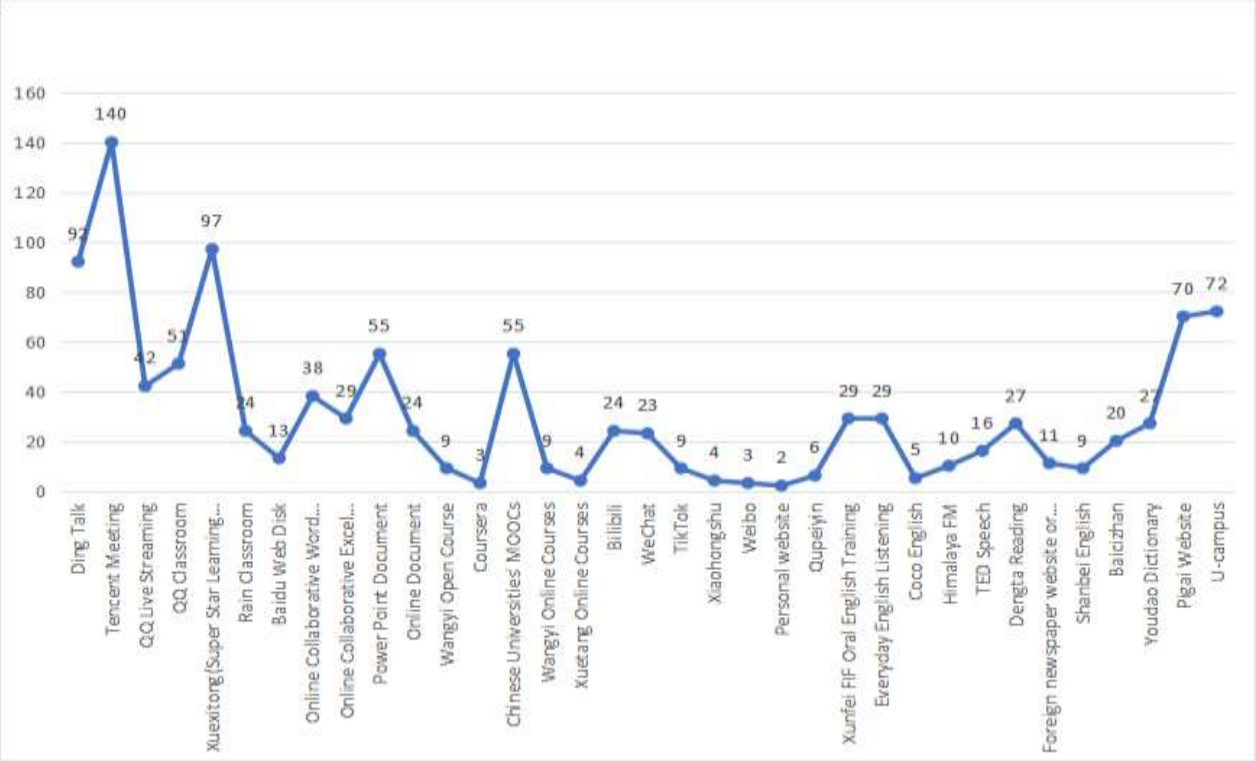

Figure 1: Platforms Used in Online Distance Learning

4.2 EFL Students' Perspectives of Emerging Technologies as a Viable Teaching and Learning Tool

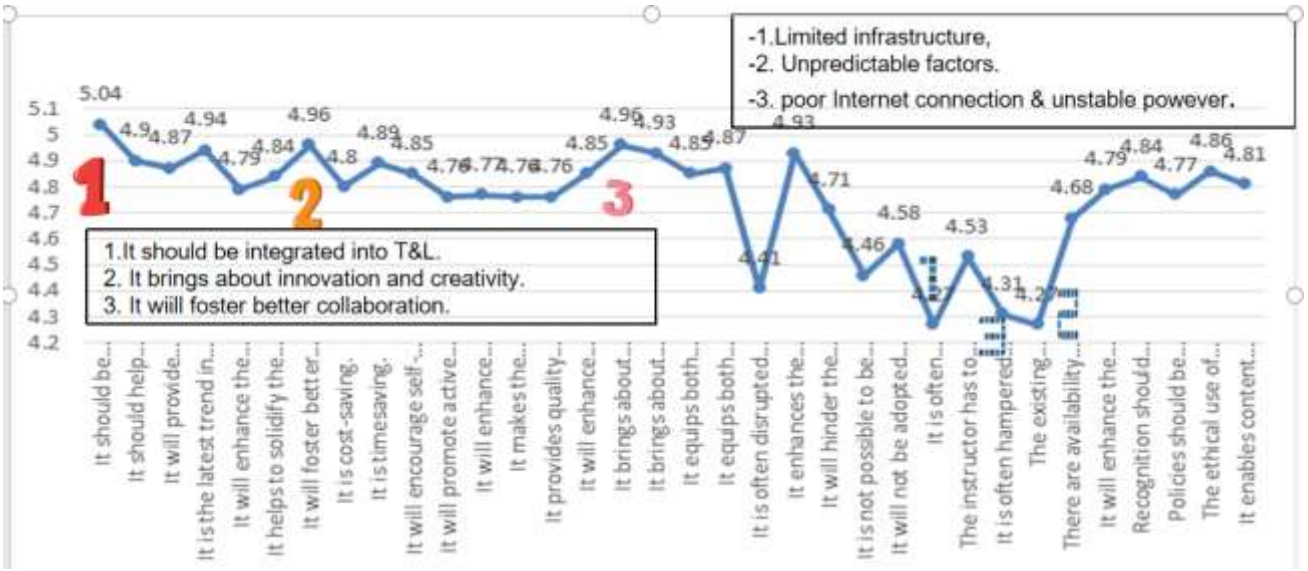

Figure 2: EFL Students' Perspectives of Emerging Technologies as a Viable Teaching and Learning Tool
Scale ： Strongly Disagree= 1, Disagree= 2, Somewhat Disagree= 3, Somewhat agree=4, Agree=5, Strongly Agree=6

The second research question examined respondents' perspectives of emerging technologies as viable teaching and learning tool. The overall mean score recorded a value of (4.75) indicating that students held a positive perception towards technology as a teaching and learning tool. Based on the findings from a few selected items shown in Table 1, it can be seen that a majority of the respondents agreed that emerging technologies should be integrated into teaching and learning (M= 5.037, SD = 1.1227) and that it brings out innovation

and creativity (M=4.96, SD=1.17) and it will foster better collaboration in learning (M=4.96, SD = 1.11). Besides that, respondents also felt that online learning was more authentic and flexible as the content provided was more attractive, and this encouraged greater student engagement.

On the flip side, respondents felt that the existing infrastructure does not allow emerging technologies to be integrated (mean = 4.27, SD= 1.47) and that emerging technologies are often hampered by various unpredictable factors such as weather and device issues (mean = 4.31, SD= 1.38), and it is often disrupted by unstable power supply (mean=4.41, SD=1.43).

4.3 Learner-to-Instructor Interaction

An important aspect investigated in this study was learner engagement based on learner-to-instructor engagement, and the findings are shown in Figure 2, which displays a few items taken from the questionnaire. The results reveal an overall mean score of 4.83, and a majority agreed with Item 5, the instructor posts a 'due date checklist' at the end of each instructional unit (M = 4.98, SD=1.09), followed by the instructor provides feedback using various mediums such as text, audio, video and visuals (M=4.91, SD=1.14) as the most important learner to instructor interaction.

Table 1. Learner-to-Instructor Interaction (n=160)

Item	Mean	SD
1 The instructor refers to students by name during the discussion forums	4.64	1.23
2 The instructor sends/posts regular announcements or email reminders	4.71	1.18
3 The instructor posts grading rubrics for all assignments	4.89	1.15
4 The instructor provides feedback using various mediums (text, audio, video and visuals etc.)	4.91	1.14
5 The instructor posts a 'due date checklist' at the end of each instructional unit	4.98	1.09

Scale : Strongly Disagree= 1, Disagree= 2, Somewhat Disagree= 3, Somewhat agree=4, Agree=5, Strongly Agree=6

On the other hand, though respondents agree that the instructor refers to students by name during the discussion forums (mean=4.64, SD=1.23), it received the lowest score compared to other items in the learner-to-instructor interaction dimension.

4.4 Learner-to-Learner Interaction

Based on Table 2, it can be observed that the majority of the respondents agree that students have choices in the selection of readings that drive discussion group formations (M=4.92, SD=1.13), followed by students working collaboratively using online communication tools to complete case studies, reports, projects, etc. (mean=4.83, SD=1.20) as the most important learner to learner interaction.

Table 2. Learner to Learner to Interaction

Item	Mean	SD
1 Students moderate their own discussions	4.82	1.14
2 Students work collaboratively using online communication tools to complete case studies, reports, projects, etc.	4.83	1.20
3 Students provide feedback on their peers' work	4.85	1.15
4 Students are required to rate the individual performance of team members on projects	4.73	1.23
5 Students have choices in the selection of readings that drive discussion group formations	4.92	1.13

Scale : Strongly Disagree= 1, Disagree= 2, Somewhat Disagree= 3, Somewhat agree=4, Agree=5, Strongly Agree=6

Conversely, although the respondents agree that students are required to rate the individual performance of team members on projects, it received the lowest score (mean=4.73, SD=1.23) in comparison to other items in the learner-to-learner interaction dimension.

4.5 Learner-to-Content Interaction

Based on the findings in Table 3, it can be observed that a majority of the respondents agree that discussions should be structured with guiding questions and/or prompts to deepen their understanding of the content (mean=4.96, SD=1.10) as the most important learner to content interaction, followed closely by students use self-tests to check their understanding of materials (mean=4.95, SD=1.08).

Table 3. Learner to Content Interaction

Item	Mean	SD
1 Students interact with content with more than one format (text, video, audio, interactive games or simulation)	4.93	1.15
2 Students work on realistic scenarios to apply content (case studies, reports, research papers, presentations, client projects)	4.92	1.11
3 Students use self-tests to check their understanding of materials	4.95	1.08
4 Discussions are structured with guiding questions and/or prompts to deepen their understanding of the content.	4.96	1.10
5 Students experience live, synchronous web conferencing for class events and/or guest talks.	4.78	1.22

Scale : Strongly Disagree= 1, Disagree= 2, Somewhat Disagree= 3, Somewhat agree=4, Agree=5, Strongly Agree=6

Meanwhile, although the respondents also agree on students' experience of live, synchronous web conferencing for class events and/or guest talks, it received the lowest score (mean=4.78, SD=1.22) compared to other items in the learner-to-content interaction dimension.

4.6 How Emerging Technologies Enhanced Online Learning

At the end of the questionnaire, an open-ended section required respondents to list how emerging technologies had enhanced their learning experience. Based on Figure 3, it can be seen that the respondents felt that supervisory guidance from instructors is still important in online learning with emerging tools, and a few voiced that face-to-face learning is still here to stay.

A majority also articulated that learning with emerging technologies improved their communication skills and helped them to be more autonomous. Besides that, they felt that learning engagement online was better as it was flexible and helped them better manage their learning, and it provided a variety of rich learning resources. A few added that emerging technologies provided more fun and efficient methods of learning as they could also watch video clips and movies to relax after long learning sessions. Overall, the respondents viewed emerging technologies in a positive light.

Figure 3: How emerging technologies enhanced online learning

.

5.0 Discussion

The overall results indicated that EFL Chinese students in University X agreed that learning engagement with emerging technologies can enhance their language learning process, while it was identified that the Tencent learning platform was the most frequently used platform for online distance learning, followed by Xuexitong and Dingding Classroom. Similar results were identified in Wiranota and Wijaya's (2021) study in which Chinese EFL students agreed that the Tencent platform was easy to use, made the learning process well managed, and was an efficient online distance learning tool during the Covid-19 outbreak.

Besides that, the findings of this study echoed Kennedy and Dunn's (2018) research, in which students were keen on interactions with their instructors and fellow colleagues through the use of technology, as well as access to wider resources and additional reading materials. In addition, online distance learning requires students to communicate proficiently through the use of technology (Brindley, 2014). Similarly, the findings of this study suggest that emerging technologies improved the students' communication skills. Moreover, other studies such as Li, Kim and Palkar (2022) and (Troop, White, Wilson, & Zeni, 2020) have highlighted that emerging technologies can enhance students' learning experience as it has a positive impact on students' creativity which is deemed as an important skill in the 21st century classroom.

6.0 Conclusion& Recommendations

This study revealed that Chinese EFL students possess a positive engagement with emerging technologies and view current technologies as a viable teaching and learning tool. Moreover, they opined that those emerging technologies improved their communication skills, made learning flexible, and helped them be more autonomous. They also agreed that it encouraged more leaner-to-learner interaction, learner to instructor and learner to content engagement. All these positive vibes articulated by the EFL students resonate well with what future learning environments hope to provide. Henceforth, it is recommended that learning organisations need to provide training and exposure to instructors for 21st-century classrooms as emerging technologies are the viable teaching and learning tools of today and the tomorrows to come.

Finally, this explorative study has its limitations in terms of instrumentation and small sample size as it involved only students from one university. Henceforth the findings cannot be generalised on the total population. Future studies could work with a larger sample size and include interviews and observations to triangulate data collected. Nevertheless, this study has contributed to the field of knowledge on emerging technologies in the EFL context of teaching and learning in China.

Acknowledgements
None

Paper Contribution to Related Field of Study
This paper provides both theoretical and practical implications for the burgeoning field of today's emerging technologies in the teaching and learning of EFL in a bid to provide quality learning environments for all.

References

Amin, F. M., & Zulfitri, Z. (2022). Emergency remote teaching during COVID-19 crisis: An analysis of EFL students' engagement in Aceh. *Englisia: Journal of Language, Education, and Humanities*, *9*(2), 46-59.

Brindley, J. E. (2014). Learner support in online distance education: Essential and evolving. In O. Zawacki-Richter & T. Anderson (Eds.), *Online distance education. Towards a research agenda* (pp. 287-310). AU Press.

Han, J., Geng, X., & Wang, Q. (2021). Sustainable development of university EFL learners' engagement, satisfaction, and self-efficacy in online learning environments: Chinese experiences. *Sustainability*, *13*(21), 11655.

Hu, X., Sidhu, G. K., & Lu, X. (2022). Exploring Positive Psychology Factors in the Quality of English as A Foreign Language Classroom Life: A Case Study. *Environment-Behaviour Proceedings Journal*, *7*(22), 17-22.

Juan, S. (2020). Analysis of Overseas Distance Chinese Character Teaching Model. *Modern Society*, *21*, 174-176.

Kennedy, M., & Dunn, T. J. (2018). Improving the use of technology enhanced learning environments in higher education in the UK: A qualitative visualization of students' views. *Contemporary Educational Technology*, *9*(1), 76-89.

Li, B. (2022). Ready for online? Exploring EFL teachers' ICT acceptance and ICT literacy during COVID-19 in mainland China. *Journal of Educational Computing Research*, *60*(1), 196-219.

Li, G., Sun, Z., & Jee, Y. (2019). The more technology the better? A comparison of teacher-student interaction in high and low technology use elementary EFL classrooms in China. *System*, *84*, 24-40.

Li, Y., Kim, M., & Palkar, J. (2022). Using emerging technologies to promote creativity in education: A systematic review. *International Journal of Educational Research Open*, *3*, 100177.

Moore. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, *3*(2), 1-7. https://doi.org/https://doi.org/10.1080/08923648909526659

Moore, M. G. (1989). Three types of interaction. *American Jounal of Distance Education*, *3(2)*, 1-7.

Moore, M. G. (1993). Is teaching like flying? A total systems view of distance education. In: Taylor & Francis.

Oyarzun, B., Stefaniak, J., Bol, L., & Morrison, G. R. (2018). Effects of learner-to-learner interactions on social presence, achievement and satisfaction. *Journal of Computing in Higher Education*, *30*, 154-175.

Shackelford, J. L., & Maxwell, M. (2012). Contribution of learner–instructor interaction to sense of community in graduate online education. *Journal of Online Learning and Teaching*, *8*(4).

Sidhu, G. K., Chen, M. K. W., Shamida, A., & Wen, C. S. (2022). Embracing the New Norm in Teaching and Learning via G Suite for Education: A Multidimensional Perspective. *Asian Journal of University Education*, *18*(4), 1062-1075.

Teng, Y., & Wang, X. (2021). The effect of two educational technology tools on student engagement in Chinese EFL courses. *International Journal of Educational Technology in Higher Education*, *18*(1), 1-15.

Troop, M., White, D., Wilson, K. E., & Zeni, P. (2020). The user experience design for learning (UXDL) framework: the undergraduate student perspective. *The Canadian Journal for the Scholarship of Teaching and Learning*, *11*(3).

Tualaulelei, E., Burke, K., Fanshawe, M., & Cameron, C. (2022). Mapping pedagogical touchpoints: Exploring online student engagement and course design. *Active Learning in Higher Education*, *23*(3), 189-203.

Van Batenburg, E. S., Oostdam, R. J., Van Gelderen, A. J., Fukkink, R. G., & De Jong, N. H. (2019). Oral interaction in the EFL classroom: The effects of instructional focus and task type on learner affect. *The Modern Language Journal*, *103*(1), 308-326.

Wiranota, H., & Wijaya, T. (2021). The international students' perception towards online learning using the tencent meeting during covid-19 outbreak. Journal of Physics: Conference Series,

Wood, G. (2022). The Global Market for Management Education. In *The Future of Management Education* (pp. 13-27). Routledge.

Yanjun, G., Luan, W. S., Md., K. M. N., Nooreen, N., & Jingxin, G. (2022, November 28–December 2). *Chinese EFL Teachers' Reflections of Online English Teaching during the COVID-19 Pandemic: A Qualitative Study* The 30th International Conference on Computers in Education(ICCE 2022), Kuala Lumpur, Malaysia. https://icce2022.apsce.net/