Teaching and Learning of English in Higher Education before, during, and after Pandemic: What differs?

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Abstract

The COVID-19 pandemic led to the worldwide closure of educational institutions, forcing a shift from face-to-face to fully online learning. As the pandemic subsided, traditional teaching resumed. This study aimed to explore English teaching and learning in higher education across three phases—before, during, and after the pandemic—by examining differences in activities and technology used. A phenomenological approach was employed, with semi-structured interviews for data collection. Purposive sampling selected eight participants—three lecturers and five students—from the English Education Department of Sriwijaya University. The findings revealed that while learning activities were largely similar across the three phases, the technology and media used varied. Before the pandemic, participants had limited exposure to online platforms, but the pandemic introduced them to new digital tools and methods. In the post-pandemic phase, participants embraced more flexibility, adopting face-to-face, online, hybrid, or blended learning models using suitable platforms. This shift has led to a general preference for the post-pandemic approach to English teaching and learning.

Keywords: English, teaching, learning, before, during, after, COVID-19 pandemic, higher education

INTRODUCTION

The COVID-19 pandemic had a profound global impact, and education was among the most affected sectors. The first case of COVID-19 was identified in Hubei Province, China, in December 2019, and the World Health Organization declared it a global pandemic on March 11, 2020. To contain the virus, governments implemented measures such as quarantines, lockdowns, and social distancing (Wang et al., 2021). These measures led to widespread school closures, disrupting education for over 1.5 billion learners worldwide. As a result, educational institutions rapidly shifted from face-to-face instruction to fully online platforms to maintain continuity (Clark et al., 2021).

This sudden shift in the educational landscape required both educators and students to adapt quickly to digital tools and online teaching methods (Huang et al., 2019; Gumus et

al., 2018). In higher education, including English language instruction, traditional classroom practices such as lectures, discussions, and evaluations (Ndlovu et al., 2023; Feng, 2021) were replaced with online learning environments using platforms like Zoom and Google Meet (Atmojo & Nugroho, 2020). Although teaching activities remained similar in structure, the delivery medium transformed significantly (Hydari et al., 2019).

As the pandemic subsided, many educators and students embraced blended learning models, which combine face-to-face instruction with virtual tools. Blended learning gained popularity due to its flexibility, offering both synchronous and asynchronous learning opportunities (Stein & Graham, 2014). The increased use of technology during the pandemic also created new avenues for language instruction (Kumar et al., 2018), and many institutions have continued using these tools in the post-pandemic era.

The shift toward online and blended learning is not just a response to a temporary crisis but represents a fundamental change in the landscape of education. Language instruction, in particular, benefits from the flexibility and accessibility of these digital tools, which offer learners more opportunities for practice and engagement beyond the classroom. The pandemic accelerated the integration of technology into education, but the broader implications extend far beyond COVID-19 (Boyd & Holton, 2019). As the world becomes increasingly digital, proficiency in using technological tools has become essential for both educators and students. Understanding how these changes affect teaching methods, student engagement, and learning outcomes is crucial for preparing educational systems to better support future disruptions and capitalize on technological advancements. Thus, examining how English language teaching evolved across the pandemic phases helps educators refine hybrid models, ensuring they can continue delivering effective and adaptable instruction in both traditional and digital contexts.

Several studies have explored the shift to online learning during the pandemic. For example, Gumus et al. (2018) and Huang et al. (2019) highlighted the rapid, unprepared transition in higher education as educators and students were forced to adapt to digital platforms. Atmojo and Nugroho (2020) found that online teaching activities often mirrored those used in physical classrooms, facilitated by tools such as Zoom. Meanwhile, research by Graesser et al. (2018) indicated that despite the new tools, the teaching content and methods largely remained unchanged, with only the delivery medium evolving.

While there is significant research on the challenges and adjustments made during the pandemic, fewer studies have investigated how educational practices have evolved post-pandemic as institutions transition back to face-to-face or hybrid learning modes. Studies by Campbel and Thompson (2018) and Serrano et al. (2019) suggest that educators and students now prefer blended learning, incorporating digital methods into traditional teaching. However, there remains a gap in the literature regarding how English language teaching has specifically evolved across the three phases—before, during, and after the pandemic.

This study aims to address that gap by exploring the evolution of English language teaching practices at Sriwijaya University, Indonesia, across the three phases of the pandemic. This research will provide novel insights by comparing changes in teaching methods, technology use, and the attitudes of educators and students toward blended learning models. The study's contribution lies in offering a broader understanding of how

English language education has adapted to technological advances and the potential for further innovations in the face of future educational disruptions.

METHOD

This study employed a qualitative, phenomenological design to explore the experiences of lecturers and students during the COVID-19 pandemic. Phenomenology was selected as it allows for understanding the shared experiences of individuals regarding a common event, in this case, the pandemic's impact on English language teaching and learning (Creswell & Poth, 2017; Van Manen, 2016). To collect data, semi-structured interviews were conducted, which provide flexibility in exploring key themes while allowing participants to share their experiences in depth (Kallio et al., 2018).

The study was conducted at the English Education Study Program of Sriwijaya University, using purposive sampling to select eight participants: three lecturers and five students. The lecturers had teaching experience ranging from five to twenty years, and the students began their studies in 2019, allowing them to provide insights into the teaching and learning transition before, during, and after the pandemic (Hamilton & Finley, 2019).

Interviews were conducted one-on-one via Zoom in July 2023, each lasting around 20 minutes. Participants were free to use either English, Indonesian or a combination of both, ensuring they could express themselves comfortably (Edwards & Holland, 2013). The interviews focused on three topics: the transition timeline in English teaching, teaching practices during each phase, and preferences for face-to-face, online, or hybrid learning.

Data were analyzed using Braun and Clarke's (2006) thematic analysis method, which involved transcribing the interviews, coding the transcripts, and identifying key themes. MindMeister was used to organize and visualize the themes for clearer interpretation (Kuswantoro et al., 2021). To ensure the validity of the findings, member checking was employed, where participants reviewed the interview transcripts and analysis to confirm their accuracy (Birt et al., 2016). This method ensured the data were trustworthy and reflected participants' experiences (Creswell, 2012).

FINDINGS AND DISCUSSION

Before Pandemic

Before April 2020, English teaching and learning at Sriwijaya University followed traditional, face-to-face methods with minimal technology integration. Lecturers and students interacted directly in physical classrooms, where teaching activities were carried out using conventional approaches such as lectures, presentations, group discussions, and in-class assessments. As Lecturer 1 explained, *"Before the pandemic, we had offline classes. In the pre-activities, I greeted the students and checked the attendance list. In the main activities, we discussed the materials in the classroom, and the students completed their assignments."* This description highlights the structured nature of in-person teaching, emphasizing immediate feedback and direct engagement between lecturers and students.

Similarly, the students shared that their learning activities were largely based on face-to-face interactions, with little use of digital tools. Student S4 noted that *"English learning was done traditionally, face-to-face, without much use of technology like the internet,"* reflecting the common approach during that period. Student S3 added that *"everything was*

done face-to-face. We went to campus, took classes, talked to lecturers, and discussed with friends in person." These accounts align with previous studies, such as those by Garcia and Weiss (2020), Ndlovu et al. (2023), and Pan et al. (2019) which described pre-pandemic teaching as heavily reliant on direct, in-class engagement with minimal technological intervention.

The teaching activities before the pandemic were typically divided into pre-activities, main activities, and post-activities, following a structured routine. Pre-activities involved tasks such as attendance checking and recalling previous lessons, while main activities included lectures, group work, and discussions. Post-activities focused on summarizing the lesson, assigning homework, and providing feedback. Lecturer 1 further explained that *"for the post-activities, we had a question-and-answer session, and then we closed the meeting."* This traditional, classroom-based structure allowed for continuous interaction and immediate clarification of doubts, which, according to Feng (2021), was a hallmark of pre-pandemic teaching methods in higher education.

Despite the growing availability of technology, the familiarity with online learning tools was limited. Most participants indicated that they had little to no experience with virtual learning platforms before the pandemic. For example, Student S5 stated, *"I wasn't familiar with online learning before because I had no experience with it before the pandemic."* Lecturer 1 confirmed this: "*Before the pandemic, everything was offline, and I never had any online activities."* This lack of exposure to digital platforms is consistent with the findings of Campbel and Thompson, (2018), who reported that face-to-face interaction was the norm in pre-pandemic education and virtual learning tools were rarely used in a structured way.

Although some students had minimal exposure to online tools in the form of asynchronous learning platforms, such instances were rare and supplementary. Student S2 mentioned, *"Actually, in the first semester, one of the lecturers utilized e-learning when they couldn't come to class, but it was only used two or three times."* This experience aligns with Tamah et al. (2021) and Ramli (2019) findings, which noted that online learning was mainly supplementary before the pandemic and used to support rather than replace in-class teaching.

Before the COVID-19 pandemic, English teaching and learning at Sriwijaya University were primarily characterized by conventional, face-to-face methods. The structured classroom routines facilitated direct interaction, with little reliance on technology. Both lecturers and students adhered to traditional pedagogical practices, with minimal exposure to online learning platforms, except in occasional, supplementary contexts. This period, as described by participants and corroborated by existing studies (Feng, 2021), represents a time when physical classroom presence and interpersonal interaction were central to the educational process.

During the Pandemic:

In April 2020, as the COVID-19 pandemic intensified, English teaching and learning at Sriwijaya University transitioned entirely to online platforms. The shift to virtual learning was a new experience for both lecturers and students, who had to quickly adapt to a digital environment. While the core structure of teaching activities, such as lectures, discussions, and presentations, remained similar to those before the pandemic, the method of delivery changed significantly. Student S1 reflected, *"During the COVID-19, we carried out the learning*

process as usual. But the difference is all of these processes were carried out using online meeting applications. So, we didn't do face-to-face."

This transition to online learning required both synchronous and asynchronous modes of instruction. Lecturer 1 explained, *"For synchronous activities, we used Zoom Meetings, while asynchronous tasks were managed through the LMS (Learning Management System)."* This aligns with Atmojo and Nugroho's (2020) findings, which noted that teachers adapted traditional classroom practices, such as lectures and group discussions, to online settings.

The change in format also required new procedures for pre-activities. According to Student S5, *"In the pre-activities, the lecturers usually sent the Zoom or Google Meet link to the class group. After that, they took attendance through e-learning, and the learning activities were carried out as usual."* This adjustment in procedure reflects the broader global trend of adopting virtual platforms, which Mustakim et al. (2021) documented as a key strategy for maintaining educational continuity during the pandemic.

Despite maintaining similar teaching activities, the online format presented new challenges. Lecturer 1 noted that engaging students during online sessions was difficult: *"Most of the students did not turn on their cameras, so I had to rely on the chat box and screen sharing to engage them in the discussion."* This echoes concerns globally about the limitations of online learning, particularly when it comes to student engagement in a virtual classroom. However, the online environment did offer certain conveniences, such as automatic grading through LMS for quizzes and assignments.

Participants also used a variety of online platforms to facilitate their learning during this period. Student S3 shared that *"We did everything online. The lecturers informed us through WhatsApp, then we joined Zoom or Google Meet for the main activities, and we submitted assignments on the UNSRI e-learning website."* This widespread use of multiple platforms highlights the flexibility of online learning, which allowed for both synchronous and asynchronous activities. Atmojo and Nugroho (2020) similarly noted that a variety of platforms were employed during the pandemic, such as Zoom, Google Classroom, and WhatsApp.

The experience of teaching and learning online broadened participants' familiarity with digital tools. Lecturer 2 reflected, *"During the pandemic, I became familiar with platforms like Google Meet, Zoom, and LMS, which I hadn't used much before. They became essential tools for teaching."* This increased reliance on technology is consistent with global trends, as many educators adapted to using digital platforms for the first time, making them essential components of the teaching process (Atmojo & Nugroho, 2020). The pandemic phase of English teaching and learning at Sriwijaya University saw a shift from in-person to entirely online instruction. Although the core teaching activities remained consistent, the medium of instruction changed, introducing new challenges related to student engagement and technology use. However, this period also accelerated the adoption of digital tools and platforms, laying the groundwork for future hybrid and blended learning models. These findings align with global research on the impact of COVID-19 on educational practices (Mustakim et al., 2021).

Post-Pandemic:

Following the improvement of the COVID-19 situation in August 2022, Sriwijaya University gradually resumed face-to-face learning. However, unlike the pre-pandemic era, the post-pandemic phase introduced a more flexible approach, combining online and offline methods. Teaching activities, including lectures, discussions, and assignments, retained their core structure, but technology—introduced during the pandemic—became an integral part of the educational process. Student S1 noted, *"After the pandemic, we started doing both online and offline classes. Sometimes, half of the students were in the classroom, and the other half joined online."*

This hybrid approach, where physical and virtual classrooms coexisted, allowed for greater flexibility in teaching and learning. Lecturer 2 explained, *"I combined the online and offline learning. We could use both methods for teaching, depending on the situation."* The ability to switch between modes, depending on student needs and circumstances, reflects a global trend toward more flexible education models. Research by Washington (2019) also supports this shift, highlighting how post-pandemic education has increasingly embraced hybrid and blended learning models to offer more adaptable teaching approaches.

Even with the return to face-to-face learning, the use of technology remained a key element. Lecturer 3 shared, *"Since we have become accustomed to using IT and learning applications, although we meet face-to-face in the class, those tools are still used for teaching and learning."* This indicates that online platforms, such as e-learning systems and digital tools introduced during the pandemic, continue to be valuable for managing tasks like assignments and quizzes. This aligns with findings from Campbel and Thompson (2018) who noted the continued reliance on digital practices in post-pandemic education globally.

The combination of online and offline learning has also diversified the teaching experience. Lecturer 1 explained, *"We are now using blended learning, where about 80% of the meetings are offline, and 20% are online, through the LMS."* This blend of methods offers flexibility and convenience, ensuring that students can participate in learning regardless of their location. Student S3 supported this by saying, *"I think we are adjusting between online and offline. It's more flexible, and sometimes the lecturers feel more comfortable with online, so they mix the two."* This flexibility has been one of the defining features of post-pandemic education, allowing lecturers and students to tailor their learning experiences to better suit their circumstances.

The use of hybrid models has also paved the way for innovation in teaching practices. Lecturer 2 mentioned, *"After the pandemic faded, we were asked to use hybrid learning, where some students had to be in the classroom, and others joined online. It was a new experience, but it worked well for both groups."* This reflects the adaptability of the post-pandemic learning environment, where educators have been able to utilize both physical and digital spaces effectively. The post-pandemic phase at Sriwijaya University brought about a shift in English teaching and learning practices, where flexibility and the integration of technology became central. While face-to-face learning returned, the use of online tools and platforms persisted, creating a more hybrid approach to education. This new model of blended learning has not only increased flexibility for both students and lecturers but also laid the foundation for more innovative teaching practices. These changes are consistent with broader educational

trends observed globally, where the use of technology in education continues to grow in importance (Campbel & Thompson, 2018).

The findings of this study have significant implications for English teaching and learning at Sriwijaya University. The transition from traditional, face-to-face instruction to online learning during the pandemic, followed by the adoption of blended and hybrid models post-pandemic, highlights a new paradigm of flexibility in education. Most participants expressed a preference for the post-pandemic era, suggesting that the integration of technology into teaching and learning should be maintained and further enhanced. Blended learning, which combines online and offline methods, offers a more adaptable and inclusive approach, allowing students and lecturers to adjust according to their needs and circumstances. The continued use of digital platforms such as LMS, Zoom, and WhatsApp, which were adopted during the pandemic, has proven to be a valuable asset for synchronous and asynchronous learning. These tools not only enrich face-to-face instruction but also enhance student engagement, implying that the university should invest in digital infrastructure and training to support the effective use of these technologies in hybrid learning environments.

However, this study is not without its limitations. It focuses on the experiences of lecturers and students from a single state university, which limits the generalizability of the findings. The context of Sriwijaya University may differ from other institutions in terms of resources, student demographics, and technological infrastructure. Additionally, the relatively small sample size of eight participants may not fully capture the diversity of experiences within the broader population of English learners and educators. The reliance on self-reported data from interviews also introduces potential biases, such as selective memory or social desirability. Furthermore, this study primarily explored subjective experiences, which, while insightful, may not provide a complete picture of the effectiveness or long-term impact of the different teaching phases.

Given these limitations, future research could expand the scope by including participants from multiple institutions, both public and private, to provide a more comprehensive understanding of how English teaching and learning has evolved across diverse educational settings. A larger, more diverse sample would offer a broader range of experiences and preferences, leading to more generalizable findings. Additionally, future studies could incorporate quantitative measures, such as academic performance, student retention, and engagement levels, to assess the effectiveness of different teaching approaches across the pre-pandemic, pandemic, and post-pandemic periods. Longitudinal studies could also track the long-term impact of blended and hybrid learning models, offering deeper insights into how these changes affect student success in the evolving educational landscape. Lastly, research into the role of digital literacy and technological competency in the success of blended learning environments could inform targeted interventions, such as training programs, to improve the overall effectiveness of hybrid education models.

CONCLUSION

This study highlights the changes in English teaching and learning at Sriwijaya University across three phases: before, during, and after the COVID-19 pandemic. Before

the pandemic, teaching was done in-person with minimal technology, focusing on face-to-face interactions. However, the pandemic forced a shift to fully online learning, requiring both lecturers and students to quickly adapt to virtual platforms like Zoom and LMS. Although teaching methods remained largely the same, the online format introduced new challenges, particularly with student engagement. Despite this, the use of technology ensured the continuity of education.

In the post-pandemic phase, a blended approach combining online and face-to-face learning emerged, which most participants preferred due to its flexibility. Technology that became essential during the pandemic continued to play a key role in enhancing student engagement and providing more adaptable learning experiences. The findings suggest that education will increasingly rely on traditional and digital methods. However, the study's focus on a single university with a small participant pool limits the generalizability of the results. Future research should explore diverse educational contexts and examine how digital literacy affects the success of hybrid learning models. Overall, the study underscores the pandemic's lasting influence on education and technology's growing importance in shaping its future.

REFERENCES

Atmojo, A. E. P., & Nugroho, A. (2020). EFL classes must go online! Teaching activities and challenges during COVID-19 pandemic in Indonesia. *Register Journal, 13*(1), 49–76. https://doi.org/10.18326/rgt.v13i1.49-76

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research, 26*(13), 1802–1811. https://doi.org/10.1177/1049732316654870

Boyd, R., & Holton, R. J. (2018). Technology, innovation, employment and power: Does robotics and artificial intelligence really mean social transformation?. *Journal of Sociology*, *54*(3), 331-345. https://doi.org/10.1177/1440783317726591

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Campbell-Watson, M., & Thompson-Smith, D. (2018). Meeting challenges: management and teaching in the post-pandemic landscape. *Advance Journal of Arts, Humanities and Social Sciences*, 1(4), 142-155. https://aspjournals.org/ajahss/index.php/ajahss/article/view/90

Clark, L., Burkett, T., Doughty, M., & Barnett, J. (2021). From face-to-face to fully online learning: The impact of COVID-19 on education systems. *International Journal of Learning, 16*(2), 33–48.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.

Edwards, R., & Holland, J. (2013). *What is qualitative interviewing?* Bloomsbury Academic.

Firmansyah, R., Putri, D., Wicaksono, M., Putri, S., Widianto, A., & Palil, M. (2021). Educational transformation: An evaluation of online learning due to COVID-19. *International Journal*

of Emerging Technologies in Learning (iJET), 16(7), 61-76. https://www.learntechlib.org/p/220042/

Feng, X., Ioan, N., & Li, Y. (2021). Comparison of the effect of online teaching during COVID-19 and pre-pandemic traditional teaching in compulsory education. *The Journal of Educational Research*, 114(4), 307-316. https://doi.org/10.1080/00220671.2021.1930986

García, E., & Weiss, E. (2020). *COVID-19 and Student Performance, Equity, and US Education Policy: Lessons from Pre-Pandemic Research to Inform Relief, Recovery, and Rebuilding.* Economic Policy Institute.

Gumus, S., Bellibas, M. S., Esen, M., & Gumus, E. (2018). A systematic review of studies on leadership models in educational research from 1980 to 2014. *Educational Management Administration & Leadershi*p, 46(1), 25-48. https://doi.org/10.1177/1741143216659296

Graesser, A. C., Fiore, S. M., Greiff, S., Andrews-Todd, J., Foltz, P. W., & Hesse, F. W. (2018). Advancing the science of collaborative problem solving. *Psychological science in the public interest*, 19(2), 59-92. https://doi.org/10.1177/1529100618808244

Hamilton, A. B., & Finley, E. P. (2019). Qualitative methods in implementation research: An introduction. *Psychiatry research*, 280, 112516. https://doi.org/10.1016/j.psychres.2019.112516

Huang, T. C., Chen, M. Y., & Hsu, W. P. (2019). International Forum of Educational Technology & Society. *Journal of Educational Technology & Society*, 22(1), 70-81. https://www.jstor.org/stable/10.2307/48647034

Hydari, M. A., Abid, G., Asif, M. F., Butt, T. H., & Lassi, Z. S. (2019). The effects of COVID-19 (Corona Virus Disease 2019) pandemic: An exploratory study of Pakistan. *Int. J. Dis. Rec. Bus. Cont*, 12(1), 1431-1449.

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2018). Environmental responsibility in hospital care: findings from a qualitative study. *Journal of Hospital Administration*, 7(5). https://doi.org/10.5430/jha.v7n5p56

Kumar Basak, S., Wotto, M., & Bélanger, P. (2018). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. *E-learning and Digital Media*, 15(4), 191-216. https://doi.org/10.1177/2042753018785180

Kuswantoro, A., Kharismaputra, A. P., Rahim, L., & Susanti, A. (2024). Utilization of mindmeister for the creation of learning objective pathways in the implementation of the merdeka curriculum. *Indonesian Journal of Devotion and Empowerment*, 6(1), 29-36. https://doi.org/10.15294/gvkx5r43

Mustakim, M., Miahara, N., & Nurmaida, D. K. (2021). Learning in Madrasah based Pesantren during the Covid-19 Pandemic. Al-Ishlah: *Jurnal Pendidikan*, 13(3), 2180-2187. https://doi.org/10.35445/alishlah.v13i3.949

Ndlovu, S. (2023). Preparedness and response to COVID-19 disruptions and learning challenges for students with disabilities in South Africa: A systematic review. *Sustainability*, 15(2), 1420. https://doi.org/10.3390/su15021420

Pan, S. C., Cooke, J., Little, J. L., McDaniel, M. A., Foster, E. R., Connor, L. T., & Rickard, T. C. (2019). Online and clicker quizzing on jargon terms enhances definition-focused but not

conceptually focused biology exam performance. *CBE—Life Sciences Education*, *18*(4), ar54. https://doi.org/10.1187/cbe.18-12-0248

Ramli, S. (2019). The Effective Use of Full Online Learning to Replace Classroom Learning During the Covid-19 Pandemic. *International Journal of Current Research and Review*. https://repository.unja.ac.id/46868/

Serrano, D. R., Dea-Ayuela, M. A., Gonzalez-Burgos, E., Serrano-Gil, A., & Lalatsa, A. (2019). Technology-enhanced learning in higher education: How to enhance student engagement through blended learning. *European Journal of Education*, *54*(2), 273-286. https://doi.org/10.1111/ejed.12330

Stein, J., & Graham, C. R. (2014). *Essentials of blended learning: A standards-based guide*. Routledge.

Tamah, S. M., Triwidayati, K. R., & Utami, T. S. D. (2020). Secondary school language teachers' online learning engagement during the COVID-19 pandemic in Indonesia. *Journal of Information Technology Education: Research*, *19*, 803-832. https://doi.org/10.28945/4626

Van-Manen, M. (2016). *Phenomenology of practice: Meaning-giving methods in phenomenological research and writing*. Routledge. https://doi.org/10.4324/9781003228073

Wang, Y., Shi, L., Que, J., Lu, Q., Liu, L., Lu, Z., ... & Shi, J. (2021). The impact of quarantine on mental health status among general population in China during the COVID-19 pandemic. *Molecular psychiatry*, *26*(9), 4813-4822. https://doi.org/10.1038/s41380-021-01019-y

Washington, G. Y. (2019). The learning management system matters in face-to-face higher education courses. *Journal of Educational Technology Systems*, 48(2), 255-275. https://doi.org/10.1177/0047239519874037