

Is the Future of Information Literacy Instruction Blended? Re-Imagining Information Literacy Instruction Post-pandemic

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Abstract

Post-pandemic, blended learning is on the rise and librarians should keep pace with this new modality of teaching in their information literacy programmes. Following an introduction to the drivers of blended learning in higher education, the implementation of blended learning in information literacy programmes is discussed, including some examples from literature. Research-backed benefits of blended learning are then covered, together with some recommendations on factors that facilitate the adoption of blended learning in libraries.

Views Expressed Disclaimer: Views and opinions expressed in this article are the authors' own and do not represent that of the authors' place of work.

A Post-Pandemic¹ Vision for Information Literacy

Since COVID-19, librarians in Singapore, and indeed globally, have gotten into the swing of online delivery following a two-month closure of all physical university campuses in Singapore in 2020. In late 2020, universities began to gradually open up, implementing policies restricting the number of physical classes that may be carried out and maximum class size allowed (Tan, 2022).

Currently, librarians are navigating the pandemic recovery climate in varied ways. Some continue conducting their information literacy programmes online via webinar software like Zoom. Others are keeping with the asynchronous mode of delivery in the form of recorded lectures, uploaded to learning management systems for students to view in their own time. Still others have returned to the previous method of face-to-face lectures to live audiences numbering in the hundreds.

But as we move from a pandemic to an endemic phase, librarians are starting to think about what lies beyond, including alternative ways to structure the delivery of our library workshops, programmes, and courses. In this paper, it is argued, that amid the uncertainty, we will converge on "blended learning", a topic of increasing interest worldwide and in Singapore in recent years (see Figure 1 and Figure 2 below).

¹ As at the time of writing, Singapore is in the post-pandemic stage of recovery, having transitioned to an endemic phase (Tan & Tan, 2021). The opinions in this article are to be read in context as endemic status may not apply to all parts of the world (Biancolella et al., 2022).

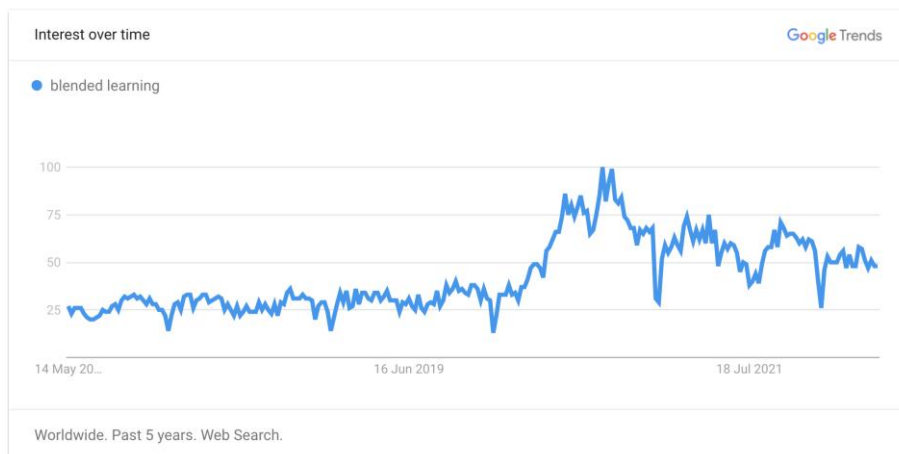


Figure 1: Increasing worldwide web searches for the term “blended learning” in the past five years, the biggest spike taking place in late August 2020 possibly due to eLearning mandates from authorities worldwide at the start of the new academic term. This is similar to the case in Singapore (see Figure 2 below).

Data source: Google Trends (<https://www.google.com/trends>)

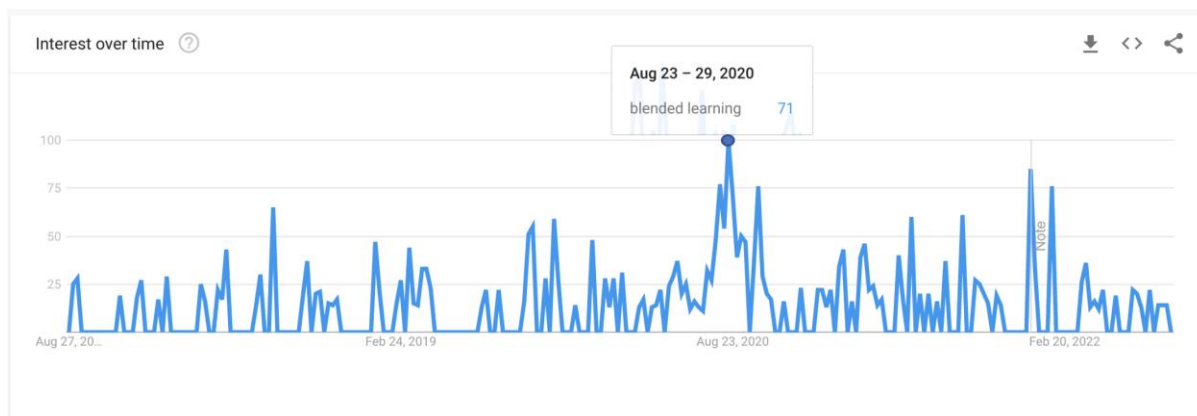


Figure 2: Web searches for the term “blended learning” in Singapore the past five years, note particularly the sharp spike between April 2020 and September 2020. This spike comes just after Singapore implementation of circuit breaker measures in April 2020, including country-wide home-based learning (Ministry of Health, 2020).

Data source: Google Trends (<https://www.google.com/trends>)

The Drivers of Blended Learning and Associated Factors

Wider Asian Context. The first driver of blended learning in academic libraries is the institutional strategic concerns of the higher education landscape. Across the Asian context, there are reports of online information literacy instruction across numerous countries such as China (Guo & Huang, 2021), Indonesia (Heriyanto et al., 2021; Heriyanto et al., 2022), and Korea (Park & Yi, 2021), to name a few.

Specific Singapore Context. Concerning Singapore, Tan (2022) has perceptively argued that an online-only mode of education which pervaded the COVID-19 years is not ideal strategically. One, it deprives students of the affordances of face-to-face learning in hands-on settings. Two, it might be difficult to attract international students to an online-only university devoid of a campus experience while maintaining the current fee structure. At the same time,

there seems to be acknowledgement that a return to the traditional mode of exclusive face-to-face teaching is unlikely, and that we should begin thinking about how to promote learning in both online and offline modes. As noted by Rapchak (2018) “[as] more learning moves online, libraries should endeavour to provide the kind of collaborative learning face-to-face and online that the technology and pedagogy theory support” (p. 384).

Indeed, blended learning is gaining momentum in Singapore. Local universities such as Nanyang Technological University (NTU) and Singapore Management University (SMU) have implemented blended learning initiatives in various forms, evinced by statements on their websites (College of Science, n.d.) or proclaiming blended learning as an institution-wide pedagogical approach adopted by the university (Centre for Teaching Excellence, n.d.). National University of Singapore (NUS) has launched a Blended Learning 2.0 programme which has the end of incorporating flexibility and “meaningful integration of face-to-face teaching with online learning” (Centre for Instructional Technology, n.d.), offering a suite of resources including grants to assist the adoption of the blended learning mode of teaching.

Library Context. Within the library world, it tends to be the academic librarians within the institutes of higher learning that lead the way in incorporating blended learning, given observations by Ashraf et al. (2021) on earlier findings that blended learning has mostly been discussed in the context of higher learning (Drysdale et al., 2013; Halverson et al., 2012).

Tools and Resources. The move towards blended learning is being given an additional push by a burgeoning suite of online collaboration, conferencing, and communication tools to support blended learning (Al-Samarraie & Saeed, 2018).

Envisioning Blended Learning in Information Literacy

As a preliminary point, there is consensus on what blended learning is not. It is not the traditional didactic method of teaching where students attend a live lecture at a specific date and location, with one-way delivery, and complete assessments after (Vallée et al., 2020).

Neither is blended learning to be confused with hybrid learning. While blended learning and hybrid learning are terms that are often used interchangeably, hybrid learning in recent literature has been used to describe learning environments where “both on-site and remote students can simultaneously attend learning activities” (Raes et al., 2020, p. 269), also known as dual-delivery learning (Marey et al., 2022).

For the purpose of this paper, we adopt the broader definition of blended learning articulated by Ashraf et al. (2021) in their umbrella review of the blended literature, which is learning that “aims to combine face-to-face (F2F) and online settings, resulting in better learning engagement and flexible learning experiences” (p. 1525). We chose this definition as it is broad enough to include existing interpretations of blended learning and leaves room for future interpretations of blended learning that may arise as a result of evolving technologies and pedagogies, while retaining the essence of combining E-learning and traditional learning to extract the benefits of both and provide a learning experience that is more engaging and/or flexible (Ashraf et al., 2021; Müller & Mildemberger, 2021).

Table 1 Illustrates some examples of the modes of blended learning used in information literacy initiatives.

Author and Year	Mode of Blended Learning Discussed
Al Ahbabi & Sirel-Khatim (2020)	Pear Deck, an add-on tool to Google Slides was used to increase interactivity, in-class engagement, and track student's learning progress.
Galvin (2011)	"Face-to-face Events' pedagogic template for blended learning in which the core learning and support activities [were] online and face-to-face activities [were] used for support at various points during the course." (p. 73)
Keisling (2018)	Integrating online instructional content into the learning management systems of on-campus classes using SoftChalk E-learning content authoring tool, together with course-specific library guides.
Chang & Hsu (2017); Humrickhouse (2021); Khailova & Bernstein (2021)	Flipped classroom model, with asynchronous online components coupled with live, librarian-led sessions.
Gil (2019)*	Students rotated in groups through stations that included print resources, as well as online resources. This allowed librarians to align multiple activities to the learning objectives, while allowing students to engage with content.
Lockhart (2021); Schwenger, (2019)	Combination of face-to-face class as well as working through the online course in a flexible and self-regulated manner.
Foo & Ng (2022)*	Online Zoom lectures with recordings that could be re-played after the class. Within the class, students were shown relevant examples and given some time for hands-on work.
Tan et al. (2020)	Pre-class introductory videos followed by 90-minute online sessions with interactive polls. As part of class participation students were also required to engage in the online forum on the learning management system.
Lim et al. (2022)*	A massive open online course (MOOC) on the fundamentals of systematic review searching developed by the library (Sukanya Naidu et al. (2021) was incorporated as an asynchronous component in healthcare and related research modules to complement face-to-face teaching and learning.
Lee et al. (2022)*	Combination of synchronous components (lectures and online consultations) and asynchronous components (post-class quiz, online videos, and online research guides). These were scaffolded over a period of four months to give students time to digest knowledge and practice their searching skills.
*Blended learning was not explicitly stated in this article, but the mode of teaching was akin to blended learning.	

Table 1: Selected case studies on information literacy reporting on the implementation of blended learning

Is Blended Learning in Libraries Really Beneficial? What the Academic Literature Says

There is quite a bit of literature pertaining to the effectiveness of blended learning, hence this could potentially impact information literacy in libraries.

A relatively recent systematic review comparing information literacy programmes in face-to-face, online, and blended formats found that blended learning confers no advantage in learning or skills outcomes over only-physical or only-online formats of teaching information literacy (Weightman et al., 2017). There are also systematic reviews suggesting that students do not indicate any preference favouring blended learning over other models when it comes to information literacy instruction (Morris, 2020).

It is argued however, that these papers do not take into account more recent primary studies reported during the COVID-19 period, and also wider accounts in educational research that explain the relative benefits of blended learning. A recent 2020 article reported positive outcomes of implementing the flipped classroom method in improving search, evaluation, and management of information sources, with relatively few negative reports of this methodology (Gómez-García et al., 2020). More recent evidence on blended learning generally accentuates the positive outcomes and relative advantage of this mode of teaching. Table 2 provides an overview of the advantages of blended learning following an umbrella review of the literature.

Psychological Outcomes	Behavioural Outcomes
Engagement	Knowledge Transfer
Motivation	Skill Progression
Satisfaction	Academic Performance
Attitude	Participation in System
High Order Thinking	Cooperation
Self-Regulation / Autonomy	
Social Interaction	
Self-Efficacy	

Table 2: Learning Outcomes of Blended Learning, adapted from Ashraf et al. (2021) is licensed CC-BY-NC 3.0

Given later studies published during the COVID-19 period regarding the “blended librarian”² (Amparo, 2020; Dabengwa et al., 2020; Raju, 2021), together with librarianship literature on blended learning (Table 1) clearly shown to be utilised in the teaching of information literacy, we can expect an upward trend of the use of technologies and pedagogies pertaining to blended learning.

Challenges of Implementing Blended Learning and How Information Literacy Librarians Can Navigate These Challenges

Awareness of challenges of blended learning might help librarians be circumspect about the steps to consider when dealing with the different stakeholders, and overcome limitations in its implementation. The challenges of implementing blended learning can be understood

² A position that blends the “information-based seeking skills of a librarian with the pedagogical and practical technical background of an instructional technologist” (Amparo, 2020)

through four lenses. The institutions, instructors, students, and technology (Ma'arop & Embi, 2016).

Institutions	Instructors
<ul style="list-style-type: none"> • Culture and adaptation to new learning strategies, mindsets, and practices • Providing blended learning friendly policies, technological resources, and support <p style="text-align: center;">Solutions:</p> <ul style="list-style-type: none"> • Analysing institutional deliverables and support mechanism for students, instructors, and other staff • Careful selection of blended learning model appropriate for the institution 	<ul style="list-style-type: none"> • Workload in terms of redesigning modules, preparing materials, and assessing students • Lack of pedagogical and technological skills to create, use, and manage content <p style="text-align: center;">Solutions:</p> <ul style="list-style-type: none"> • Training (technological and pedagogical) • Teaching assistants to reduce workload burden • Collaborative networking to share ideas and best practices
Students	Technology
<ul style="list-style-type: none"> • Lack of self-regulation skills such as discipline and responsiveness • Poor time management • Heterogenous backgrounds <p style="text-align: center;">Solutions:</p> <ul style="list-style-type: none"> • Helpdesk • Mental and health counselling services • Personal development and management skills 	<ul style="list-style-type: none"> • Internet connectivity faults • Lack of body language cues in online environment <p style="text-align: center;">Solutions:</p> <ul style="list-style-type: none"> • Technical support team to deal with faults and minimise interruptions of programmes • Strengthening student-teacher interaction, planning regular checkpoints with live student interaction, and utilising student interaction

Table 3: Challenges of blended learning and recommendations to overcome them adapted from Ma'arop & Embi (2016), licensed [CC-BY](#) and Rasheed et al. (2020)

Considering the above framework, librarians should be sensitive to institutional changes in the university context, deliverables, and blended learning models, and time library's initiative of blended learning accordingly. For example, at NUS, the process of incorporating blended learning into information literacy programmes are made easier by the adoption of blended learning as an institution-wide pedagogical approach. Principles of self-directed learning and experiential learning are emphasised. There is governance in the form of guidelines, framework, and technological support from the Centre for Instructional Technology (NUS CIT) and the Centre of Development of Teaching and Learning (NUS CDTL). These plans can be extrapolated and applied to the library context.

As instructors, librarians themselves can benefit from the training opportunities on blended learning, and participate in communities to discuss best practices of blended learning. It is important to avoid the mistake of using blended learning tools and techniques just for the sake of it. Priority must be given to ensuring learning outcomes are met when employing technology or pedagogical tools in teaching and learning. Blended learning should have the effect of helping students better achieve the learning outcomes of the course and learn more effectively.

Ultimately, for blended learning to be implemented effectively, it boils down to librarians to survey their own institution's policies and directions, and more importantly, obtain the requisite technological and pedagogical training to carry out blended learning effectively. As noted by Zaugg et al. (2021, p. 325), "While blended teaching can adopt the best of both the online and face-to-face worlds, we often forget that it can also be made up of the worst of these two teaching worlds. The best of blended teaching pedagogies moves the learning experience to be more student-centred and focussed on greater active learning in both in-person and online modalities.". This is a caution to neither blindly nor rigidly employ blended learning tools to our library instruction in the name of 'blended learning'. Conscious steps must be taken to compensate for the potential lack of physical cues when teaching online – including but not limited to (Fun et al., 2020):

- strengthening student-teacher interaction: engaging students through the chat function, turning on the video, positioning the video at eye-level
- planning regular checkpoints with live student interaction: using collaborative audience participation tools such as PollEverywhere, Mentimeter, Kahoot!, Padlet, and Pigeonhole Live
- utilising student interaction: encourage interaction through problem-solving in virtual breakout rooms.

Lessons must be planned strategically focussing at all times on leveraging the strengths of blended learning: combining modalities to increase the learning experience through engagement and flexibility.

Conclusion

Academic librarians wear many hats, and one hat that has increasing relevance is that of information literacy instruction for researchers and students. Done right, blended learning may help bolster our credibility as educators at our institution and beyond. As the educational systems in which we operate evolve in their pedagogies to enhance teaching and learning, librarians, as stakeholders in this system, ought to keep up with the changes to position ourselves as an enduring part of the higher education institution. Sustainability of library efforts to increase information literacy awareness and education demands not only careful analysis of our pedagogy and technology employed in the delivery of our programmes, but also the flexibility to rethink and adjust them continually.

Acknowledgements: *The authors would like to thank Sukanya Naidu, Hashimah Johari, and Wong Kah Wei for their kind support and for looking through the drafts of this piece.*

References

- Al Ahababi, M., & Sirel-Khatim, M. (2020). *Integrating blended learning in information literacy teaching with Pear Deck*. Information Literacy Network of the GCC 2020-2021, Zayed University, Abu Dhabi, UAE.
<https://scholarworks.uaeu.ac.ae/cgi/viewcontent.cgi?article=1005&context=presentations>
- Al-Samarraie, H., & Saeed, N. (2018). A systematic review of cloud computing tools for collaborative learning: Opportunities and challenges to the blended-learning environment. *Computers & Education*, 124, 77–91.
<https://doi.org/10.1016/j.compedu.2018.05.016>
- Amparo, A. (2020). *Three blended librarians' narratives on developing professional identities* (Order No. 28154440). Available from ProQuest Dissertations & Theses Global; Social Science Premium Collection. (2470896827).
- Ashraf, M. A., Yang, M., Zhang, Y., Denden, M., Tlili, A., Liu, J., Huang, R., & Burgos, D. (2021). A systematic review of systematic reviews on blended learning: Trends, gaps, and future directions. *Psychology Research and Behavior Management*, 14, 1525–1541.
<https://doi.org/10.2147/PRBM.S331741>
- Biancolella, M., Colona, V. L., Mehrian-Shai, R., Watt, J. L., Luzzatto, L., Novelli, G., & Reichardt, J. K. V. (2022). COVID-19 2022 update: Transition of the pandemic to the endemic phase. *Human Genomics*, 16(1), 19. <https://doi.org/10.1186/s40246-022-00392-1>
- Centre for Instructional Technology. (n.d.). What is Blended Learning 2.0? Centre for Instructional Technology; National University of Singapore. Retrieved May 5, 2022, from <https://cit.nus.edu.sg/blended-learning-2-0/>
- Centre for Teaching Excellence. (n.d.). Blended learning @ SMU. Blended Learning @ SMU; Singapore Management University. Retrieved May 6, 2022, from <https://cte.smu.edu.sg/blendedlearning>
- Chang, N., & Hsu, H. (2017). Integrating action learning into information literacy instruction in a cross-disciplinary blended learning environment. *Undefined*.
<https://www.semanticscholar.org/paper/Integrating-action-learning-into-information-in-a-Chang-Hsu/b2ee7b6bdf66ccc78d5838f6d3e65829b0c83a21>
- College of Science. (n.d.). How Will I Learn? College of Science; Nanyang Technological University. Retrieved May 6, 2022, from <https://www.ntu.edu.sg/science/admissions/undergraduate/how-will-i-learn>
- Dabengwa, I. M., Raju, J., & Matingwina, T. (2020). Applying interpretive phenomenological analysis to library and information science research on blended librarianship: A case study. *Library & Information Science Research*, 42(4), 101055.
<https://doi.org/10.1016/j.lisr.2020.101055>

- Drysdale, J. S., Graham, C. R., Spring, K. J., & Halverson, L. R. (2013). An analysis of research trends in dissertations and theses studying blended learning. *The Internet and Higher Education*, 17, 90–100. <https://doi.org/10.1016/j.iheduc.2012.11.003>
- Foo, M. L., & Ng, T. T. M. (2022). Incorporating Cost–Benefit Analysis and Business Databases as Part of an Interdisciplinary Course on Energy Resources. *Journal of Chemical Education*, 99(4), 1808–1815. <https://doi.org/10.1021/acs.jchemed.1c01058>
- Fun, M. F., Ng, T. T. M., & Kamei, R. K. (2020). How to create engaging online learning amid COVID-19 pandemic: Lessons from Singapore. *The Conversation*. <http://theconversation.com/how-to-create-engaging-online-learning-amid-covid-19-pandemic-lessons-from-singapore-138979>
- Galvin, B. (2011). Evidence-based practice: A mind-altering substance. A blended learning course teaching information literacy for substance use prevention work. *Journal of Information Literacy*, 5(1), 65–88. <https://doi.org/10.11645/5.1.1512>
- Gil, E. L. (2019). Introducing information literacy into a marketing budget class assignment: A case study. *Journal of Business & Finance Librarianship*, 24(1–2), 1–16. <https://doi.org/10.1080/08963568.2019.1632646>
- Gómez-García, G., Hinojo-Lucena, F.-J., Cáceres-Reche, M.-P., & Ramos Navas-Parejo, M. (2020). The contribution of the flipped classroom method to the development of information literacy: A systematic review. *Sustainability*, 12(18), 7273. <https://doi.org/10.3390/su12187273>
- Guo, J., & Huang, J. (2021). Information literacy education during the pandemic: The cases of academic libraries in Chinese top universities. *The Journal of Academic Librarianship*, 47(4), 102363. <https://doi.org/10.1016/j.acalib.2021.102363>
- Halverson, L. R., Graham, C. R., Spring, K. J., & Drysdale, J. S. (2012). An analysis of high impact scholarship and publication trends in blended learning. *Distance Education*, 33(3), 381–413. <https://doi.org/10.1080/01587919.2012.723166>
- Heriyanto, Christiani, L., & Rukiyah. (2022). Lecturers' information literacy experience in remote teaching during the COVID-19 pandemic. *PLOS ONE*, 17(3), e0259954. <https://doi.org/10.1371/journal.pone.0259954>
- Heriyanto, Prasetyawan, Y. Y., & Krismayani, I. (2021). Distance learning information literacy: Undergraduate students experience distance learning during the COVID-19 setting. *Information Development*, 37(3), 458–466. <https://doi.org/10.1177/02666669211018248>
- Humrickhouse, E. (2021). Flipped classroom pedagogy in an online learning environment: A self-regulated introduction to information literacy threshold concepts. *The Journal of Academic Librarianship*, 47(2), 102327. <https://doi.org/10.1016/j.acalib.2021.102327>

- Keisling, B. (2018). Blended learning: Scaling library services and instruction to support changing educational landscapes. *Library Management*, 39(3/4), 207–215. <https://doi.org/10.1108/LM-08-2017-0080>
- Khailova, L., & Bernstein, M. (2021). Scaling up library information literacy instruction by developing learning management systems ready asynchronous modules. *Georgia International Conference on Information Literacy*. <https://digitalcommons.georgiasouthern.edu/gaintlit/2021/2021/33>
- Khan, R. A., Atta, K., Sajjad, M., & Jawaid, M. (2022). Twelve tips to enhance student engagement in synchronous online teaching and learning. *Medical Teacher*, 44(6), 601–606. <https://doi.org/10.1080/0142159X.2021.1912310>
- Lee, L. C. M., Rickard Liow, S. J., Sze, W. P., Chin, M. C. A., Lim, S. C., & Ng, T. T. M. (2022). Interdisciplinary faculty-librarian collaboration in NUS: An insider's view. *Teaching Connections*. <https://blog.nus.edu.sg/teachingconnections/2022/06/20/interdisciplinary-faculty-librarian-collaboration-in-nus-an-insiders-view/>
- Lockhart, J. (2021). Embedding an information literacy course into a learning management system: A case study. *Library Management*, 42(6/7), 376–394. <https://doi.org/10.1108/LM-09-2020-0129>
- Ma'arop, A. H., & Embi, M. A. (2016). Implementation of blended learning in higher learning institutions: A review of the literature. *International Education Studies*, 9(3), 41–52. <https://eric.ed.gov/?id=EJ1093338>
- Marey, A., Goubran, S., & Tarabieh, K. (2022). Refurbishing classrooms for hybrid learning: Balancing between infrastructure and technology improvements. *Buildings*, 12(6), 738. <https://doi.org/10.3390/buildings12060738>
- McAulay, K. (2020). Library support to students on blended-learning courses: some thoughts on best practice. *SCONUL Focus*, 71, 45–49. <https://www.sconul.ac.uk/sites/default/files/documents/Karen%20McAulay%20FOCUS%2071.pdf>
- Ministry of Health. (2020, April 3). *CIRCUIT BREAKER TO MINIMISE FURTHER SPREAD OF COVID-19*. Ministry of Health. <https://www.moh.gov.sg/news-highlights/details/circuit-breaker-to-minimise-further-spread-of-covid-19>
- Morris, D. (2020). A review of information literacy programmes in higher education: The effects of face-to-face, online, and blended formats on student perception. *Journal of Information Literacy*, 14(1), 19–40. <https://eric.ed.gov/?id=EJ1300514>
- Müller, C., & Mildenerger, T. (2021). Facilitating flexible learning by replacing classroom time with an online learning environment: A systematic review of blended learning in

- higher education. *Educational Research Review*, 34, 100394. <https://doi.org/10.1016/j.edurev.2021.100394>
- Park, Y. K., & Yi, Y. J. (2021). The effects of online user instruction on information literacy ability: Suggestions for COVID-19 era. *Journal of Korean Library and Information Science Society*, 52(3), 267–285. <https://doi.org/10.16981/kliss.52.3.202109.267>
- Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2020). A systematic literature review on synchronous hybrid learning: Gaps identified. *Learning Environments Research*, 23(3), 269–290. <https://doi.org/10.1007/s10984-019-09303-z>
- Raju, J. (2021). Shaping LIS education for blended professionals in a pluralist information environment: Global reflections. *Journal of Education for Library and Information Science*, 62(4), 366–382. <https://doi.org/10.3138/jelis-62-4-2020-0024>
- Rapchak, M. E. (2018). Collaborative learning in an information literacy course: The impact of online versus face-to-face instruction on social metacognitive awareness. *The Journal of Academic Librarianship*, 44(3), 383–390. <https://doi.org/10.1016/j.acalib.2018.03.003>
- Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education*, 144, 103701. <https://doi.org/10.1016/j.compedu.2019.103701>
- Saichaie, K. (2020). Blended, flipped, and hybrid learning: Definitions, developments, and directions. *New Directions for Teaching and Learning*, 2020(164), 95–104. <https://doi.org/10.1002/tl.20428>
- Schwenger, B. (2019). Integrating digital literacies through blended learning in a first-year undergraduate course. In Y. W. Chew, K. M. Chan, and A. Alphonso (Eds.), *Personalised Learning. Diverse Goals. One Heart. ASCILITE 2019 Singapore* (pp. 552-557).
- Sukanya Naidu, Toh, K. K., Chin, A., Wong, S. N., Ng, S., & Lim, S. C. (2021). *The Art and Science of Searching in Systematic Reviews*. [MOOC]
- Tan, H. R., Chng, W. H., Chonardo, C., Ng, M. T. T., & Fung, F. M. (2020). How chemists achieve active learning online during the COVID-19 pandemic: Using the community of inquiry (Coi) framework to support remote teaching. *Journal of Chemical Education*, 97(9), 2512–2518. <https://doi.org/10.1021/acs.jchemed.0c00541>
- Tan, J. (2022). Higher education in Singapore. In L. P. Symaco & M. Hayden (Eds.), *International Handbook on Education in South East Asia* (pp. 1–17). Springer Singapore. https://doi.org/10.1007/978-981-16-8136-3_8-1
- Tan, L. F., & Tan, M. F. (2021). Addressing Endemic COVID-19 With High Vaccination Success: Lessons From Singapore. *Journal of the American Medical Directors Association*, 22(12), 2515–2516. <https://doi.org/10.1016/j.jamda.2021.09.028>

- Vallée, A., Blacher, J., Cariou, A., & Sorbets, E. (2020). Blended learning compared to traditional learning in medical education: Systematic review and meta-analysis. *Journal of Medical Internet Research*, 22(8), e16504. <https://doi.org/10.2196/16504>
- Weightman, A. L., Farnell, D. J., Morris, D., Strange, H., & Hallam, G. (2017). A systematic review of information literacy programs in higher education: Effects of face-to-face, online, and blended formats on student skills and views. *Evidence Based Library and Information Practice*, 12(3), 20–55.
- Zaugg, H., Graham, C. R., Lim, C. P., & Wang, T. (2021) Chapter 16: Current and future directions of blended learning and teaching in Asia. In C. Graham, & C. P. Lim (eds.), *Blended Learning for Quality Access in Asian Universities*, Springer Nature. <https://link.springer.com/book/10.1007/978-981-33-4106-7>