

## Introduction to the special issue on emergency remote teaching (ERT) under COVID-19

The ongoing COVID-19 pandemic has forced schools, universities and other education institutions to shut down for a number of months in 2020. Some of these institutions may have reopened, but many are still closed. To facilitate teaching and learning activities during this difficult period, educators from around the world and at all levels have shifted from in-class teaching and learning to emergency distance or remote teaching. Emergency remote teaching (ERT) is a temporary shift of instructional delivery to an alternate mode due to crisis circumstances. The primary objective is to quickly provide temporary, reliable access to instruction and support during a crisis. The goal is not to re-create a robust educational ecosystem (Hodges *et al.*, 2020); nonetheless, educators still aim to optimize quality of instruction, adapting to local conditions while relaxing accountability goals and often evaluation and measurements. ERT is not the same thing as distance learning; it is a situation of triage and one in which schools, teachers and communities are all doing their best amidst challenging emergency circumstances.

The persistence of digital divides will necessarily impede success of *predominantly online* ERT. For instance, a relatively small, but significant, proportion of families in all the US states still lack home internet access and adequately functioning computing devices, which poses serious problems for children in accessing a school's provision of ERT if it is predominantly online in format. Some states and internet service providers are offering free and subsidized networking accounts to families, loaner device technologies, etc.; however, the reach of these programs was far from universal as of Spring of 2020, under the pressures of swift transition to remote teaching. It is unclear how readily accessible subsidized technology affordances will become for students, should COVID conditions and the need for ERT continue; this will vary regionally. Digital divide gaps may necessitate that some schools and teachers provide workaround non-technology-based instructional options such as send-home activities and assignments, phone conferences, etc.

Another key challenge inherent to providing ERT is that local conditions vary so widely across state, regional and national boundaries, as it pertains to public education policies, standards, processes, and accountability goals, as well as pandemic health conditions and population demographics. As a result, centralized, generalizable guidelines are elusive. Further, pandemic conditions are not static, they are constantly shifting, making ongoing planning a continuous moving target. This has been referred to in the press as “building the plane as we fly it.” Any set of guidelines is only as helpful as its capacity to be customized for local contexts and evolving pandemic conditions across time. Guidelines vary as to their “level of analysis” – for instance, broad guidelines may aim to support educators with general principles for implementation of ERT at a high level of applicability, e.g. regardless of grade level or school subject domain, etc. The International Society for Technology in Education (ISTE) for example offers a set of broad guidelines to teachers and districts, whom they first and foremost exhort to work closely with their local community members to “ensure digital equity” (ISTE guideline's first imperative) (Snelling and Fingal, 2020). ISTE urges educators and school leaders to facilitate the anticipatory practicing of emergency protocols prior to any given event, to provide clear expectations to all constituents, to take time to plan, to prepare an emergency backpack or bag of materials in case school access is impeded, to establish daily schedules and routines, to provide robust learning by breaking



learning into chunks, to design independent learning activities, to address the emotional toll and to choose appropriate accessible tools and stick to them (Snelling and Fingal, 2020).

Another example of a broad-level framework of pedagogical ERT guidelines is situated in the scholarly learning and education sciences literatures, having been communicated in June of 2020 by the noted scholar Dr Paul Kirschner in an online video presentation to a grassroots teacher-led community called ResearchEdUK, which made the video public on YouTube alongside Kirschner's downloadable PDF slides from the presentation ([www.youtube.com/watch?v=Glc1IL6-tcw](http://www.youtube.com/watch?v=Glc1IL6-tcw)). In this video, Kirschner distills key tips deriving from an upcoming new book to be released in Fall 2020 with co-authors, entitled *Lessons for Learning: 12 Building Blocks for Teaching* (Surma et al., 2020). The tips comprise the following (Kirschner, 2020).

“Ground 0: Destroy weapons of mass distraction (i.e., disallow social media and other activities that will take students off-task from the central learning focus) (2020).

- Stick to the essentials (limit new stuff, maintain old stuff);
- Spread learning and practice (for instance provide instruction for 15 minutes, and then offer practice time; repeat);
- Communicate goals and success criteria (tell students where you are going and what you expect);
- Frame new material in the bigger picture (instruct in layers; contextualize; add complexity one layer at a time; review; synthesize);
- Use/prepare relevant prior knowledge (check that prior knowledge is still there; prime it; provide anchors and ideational scaffolds; contextualize new stuff);
- Give examples before exercises;
- Offer support and guidance during practice (maintain direction; reduce freedom before expanding; give hints/prompts; model; question it);
- Support/stimulate active cognitive processing that does not over tax working memory;
- (Let students) check for mastery with recall strategies, graphic organizers and other aids; and
- Provide adequate feedback which retraces for students – the “why, how, and what” processes that led them to their final product” (Kirschner, 2020).

More specific guidelines may pertain to focal aspects of ERT, such as a guideline that specifies best practices for structuring video web conferencing instruction followed by problem set completion among 3rd and 4th graders, or, specific guidelines on teaching the experimental method to middle school science students using freely available online science simulations. Overall, while we have decades of research-supported evidence offering design pragmatics stemming from the learning sciences, very little, if any of this work was conducted with a goal to address an immediate, almost overnight emergency transition to remote instruction modalities including online teaching, across all subject domains and grade levels in any given locality. While can certainly build upon the existing research, it will be a rare school leader and educator, that can succeed in integrating leading-edge educational technology “innovations” during crisis moments such as these – especially given that established curricular learning objectives and accountability goals requiring standardized testing (intended, still, to continue on in the future once school is back in session) – have not changed.

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It was in humility given these unique and challenging circumstances, and a spirit of service to our fellow educators at all grade levels, that we the editors turned to the task of developing a special issue on ERT for *Information and Learning Sciences*. To support provision of educational continuity in these unprecedented times and empower the use of evidence-based teaching and learning approaches as much as possible – in April of 2020 we worked with the publisher Emerald to issue a call for papers with a fast deadline and turnaround of a few weeks. We received an overwhelming response of over 80 timely and interesting articles from a wide range of countries/economies including the USA, Hong Kong, Japan, Australia, Germany, Ireland, Switzerland, Canada and Taiwan. A heartening number of internationally renowned scholars from universities such as Carnegie Mellon University, Kyoto University, MIT, The University of Queensland, The University of British Columbia, University of Michigan, University of Pennsylvania and University of Southern California submitted one or more articles to this special issue. A total of 42 short articles (3,500–3,700 words each) were accepted. A lot of credit goes to our Associate Editors and Editorial Advisory Board members, 32 of whom helped review 1–3 submitted articles each, despite being busy scholars unduly taxed themselves in this moment of crisis. We were touched by their genuine help and would like to extend our sincerest gratitude to them!

When we analyzed the nature and scope of the accepted articles, we identified a number of categories and subcategories into which the articles could be classified: by *Context* (public and school librarianship, parenting, teacher professional development, both K-12 and higher education, K-12 education, higher education); and *Study Type* (theory and proposed design frameworks, design/implementation studies, cross-sectional analyses/cases/lessons learned). Table 1 shows the articles accepted in each category. Because we are publishing so many of these articles, we hope that this categorical framework can offer a basic organizing structure and logic for readers' browsing, selecting and viewing. We also note that this categorization in some ways addresses the challenge we identified, regarding the need to tailor guidelines to specific contexts. However, we want to point out, that just because an article is listed in the "higher education" category and might, for instance, pertain to computer science education, it may still readily contain design strategies that offer value and applicability across contexts, for instance to teachers of other grade levels, subject domains, etc.

As for "Study Type," we sought to somewhat broadly distinguish the methods used by the authors. "Theory and proposed design framework" articles build upon existing scholarly evidence bases and offer guiding synthesis and pragmatic instructional recommendations. "Design/implementation study" articles contain empirical research results stemming from deliberately designed and well-staged curricular innovations, most of which were implemented with design research methods stemming from the learning sciences. "Cross-sectional analyses/cases/lessons learned" articles also report empirical research results, stemming more so from anecdotal and semi-formalized school implementation case studies, survey research, and interviews with school stakeholders. We propose that all study types, across all contexts we have identified in the accepted articles, have strengths of contribution in this moment of crisis, and a legitimate noteworthy place in the literature.

The articles will be published in two issues. The publisher Emerald has agreed to make them accessible free of the paywall for the first six months. We want to express our thanks to Emerald and our publisher Ms Eileen Breen and content editor Mr George Barber for their innovative spirit of engagement and service under emergency conditions, in offering the articles for free as downloadable PDFs, to education practitioners and all readers, in anticipation of the potential continuation of COVID-19 ERT conditions in schools leading

Context	Study type	Authors
Public and School Librarianship Contexts	Theory and proposed design frameworks	Hands, A. (2020). "Tapping into the assets of first-generation students during times of transition."
	Design/ implementation studies	Kim, S.H., Choi, G.W., Jung, Y.J. (2020). "Design principles for transforming making programs into online settings at public libraries."
Parenting Context	Cross-sectional analyses/cases/lessons learned	Burns, E. (2020). "School librarians online: Integrated learning beyond the school walls."
	Cross-sectional analyses/cases/lessons learned	Zainuddin, Z., Perera, Corinne J., Haruna, H. (2020). "Literacy in the new norm: Stay-home game plan for parents."
Teacher Professional Development Contexts	Theory and proposed design frameworks	Gabaree, L., Rodeghiero, C., Presicce, C., Rusk, N., Jain, R. (2020). "Designing creative and connected online learning experiences."
	Design/ implementation studies	Murai, Y., Muramatsu, H. (2020). "Application of creative learning principles within blended teacher professional development on integration of computer programming education into elementary and middle school classrooms."
	Cross-sectional analyses/cases/ lessons learned	Yoon, S., Miller, K., Richman, T., Wendel, D., Schoenfeld, I., Anderson, E., Shim, J., Marei, A. (2020). "A social capital design for delivering online asynchronous professional development in a MOOC course for science teachers."
Both K-12 and Higher Education Contexts	Theory and proposed design frameworks	Presicce, C., Jain, R., Rodeghiero, C., Gabaree, L., Rusk, N. Habiburrahim, H. (2020). "WeScratch: an inclusive, playful, and collaborative approach to creative learning online."
		Donaldson, J. (2020). "Building a digitally-enhanced community of practice."
		Strauß, S., Rummel, N. (2020). "Promoting interaction in online distance education: Designing, implementing and supporting collaborative learning."
K-12 Contexts	Design/ implementation studies	Zhu, X., Chen, B., Avadhanam, R., Shui, H., Zhang, R. (2020). "Reading and connecting: Using social annotation in online classes."
		Hickey, D., Duncan, J., Gaylord, C., Hitchcock, C., Itow, R., Stephens, S. (2020). "gPortfolios: A Pragmatic Approach to Online Asynchronous Assignments."
	Theory and proposed design frameworks	Aguilar, S. (2020). "Guidelines and tools for promoting digital equity."
		Aguilar, S. (2020). "A research-based approach for evaluating resources for transitioning to teaching online."
		Aguliera, E., Nightengale-Lee, B. (2020). "Emergency remote teaching across urban and rural contexts: perspectives on educational equity."
		Carter, R., Rice, M., Yang, S., Jackson, H. (2020). "Self-regulated learning in online learning environments: strategies for remote learning."

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**Table 1.**  
Articles by category  
in this 2020 special  
issue of *information  
and learning sciences*

Context	Study type	Authors
		<p>Flynn, P. (2020). "Design-Ed: A pedagogical toolkit to support k-12 teachers' emergency transition to remote online education."</p> <p>Greenhow, C., Chapman, A. (2020). "Social distancing meet social media: digital tools for connecting students, teachers, and citizens in an education emergency."</p> <p>Macmahon, S., Leggett, J., Carroll, A. (2020). "Promoting individual and group regulation through social connection: Strategies for remote learning."</p> <p>Murillo, A., Jones, K. (2020). "A 'just-in-time' pragmatic approach to creating quality matters-informed online courses."</p>
	Design/ implementation studies	<p>Jayathirtha, G., Fields, D., Kafai, Y., Chipps, J. (2020). "Supporting making online: The role of artifact, teacher, and peer interactions in crafting electronic textiles."</p> <p>Jung, H., Brady, C. (2020). "Maintaining rich dialogic interactions in the transition to synchronous online learning."</p> <p>Tiwari, S. (2020). "Q-Bot, The Quarantine Robot: Joint-media engagement between children and adults about quarantine living experiences."</p>
	Cross-sectional analyses/ cases/ lessons learned	<p>Anderson, E., Hira, A. (2020). "Loss of brick and mortar schooling: How elementary educators respond."</p> <p>Forde, K., Code, J., Ralph, R. (2020). "Pandemic designs for the future: Perspectives of technology education teachers during COVID-19."</p> <p>Hall, T., Connolly, C., Ó Grádaigh, S., Burden, K., Kearney, M., Schuck, S., Bottema, J., Hustinx, W., Evens, M., Koenraad, T., Makridou, E., Cazemier, G., Kosmas, P. (2020). "Education in precarious times: A comparative study across 6 countries to identify design priorities for mobile learning in a pandemic."</p> <p>Itow, R. (2020). "Fostering valuable learning experiences by transforming current teaching practices: Practical pedagogical approaches from online practitioners."</p> <p>Justis, N., Litts, B., Reina, L., Rhodes, S. (2020). "Cultivating staff culture online: How Edith Bowen Laboratory School responded to COVID-19."</p> <p>Peterson, L., Scharber, C., Thuesen, A., Baskin, K. (2020). "A Rapid Response to COVID-19: One District's Pivot from Technology Integration to Distance Learning."</p>

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Table 1.

Context	Study type	Authors
Higher Education Contexts	Theory and proposed design frameworks	Whittle, C., Tiwari, S., Yan, S., Williams, J. (2020). "Emergency Remote Teaching Environment: A conceptual framework for responsive online teaching in crises." Copeland, C., Thompson, K. (2020). "Inclusive considerations for optimal online learning in times of disasters and crises." Duvall, M., Matranga, A., Silverman, J. (2020). "Designing for and facilitating knowledge-building discourse in online courses." Fujita, N. (2020). "Transforming online teaching and learning: Towards learning design informed by information science and learning sciences." Greenhow, C., Galvin, S. (2020). "Teaching with social media: Evidence-based strategies for making remote higher education less remote." Quintana, R., Quintana, C. (2020). "When classroom interactions have to go online: The move to specifications grading in a project-based design course."
	Design/ implementation studies	Craig, K., Humburg, M., Danish, J., Szostalo, M., Hmelo-Silver, C., McCranie, A. (2020). "Increasing Students' Social Engagement During COVID-19 with Net.Create: Collaborative Social Network Analysis to Map Historical Pandemics During a Pandemic." Howley, I. (2020). "Adapting guided inquiry learning worksheets for emergency remote learning." Olsen, J., Faucon, L., Dillenbourg, P. (2020). "Transferring interactive activities in large lectures from face-to-face to online settings." Sankaranarayanan, S., Kandimalla, S.R., Cao, M., Maronna, I., An, H., Bogart, C., Murray, R.C., Hilton, M., Sakr, M., Rose, C. (2020). "Designing for learning during collaborative projects online: Tools and takeaways."
	Cross-sectional analyses/ cases/ lessons learned	Fulton, C. (2020). "Collaborating in online teaching: Inviting e-guests to facilitate learning in the digital environment." Kessler, A., Barnes, S., Rajagopal, K., Rankin, J., Pouchak, L., Silis, M., Esser, W. (2020). "Saving a semester of learning: MIT's emergency transition to online instruction." Yu, Y., Li, X. (2020). "Characteristics of asynchronous online discussions in a graduate course: An exploratory study."

**Table 1.**

into Fall of 2020 – to be of service in their educational design. We believe the articles contribute insight on how to continue our teaching activities in a variety of modalities and with a variety of guidelines on instructional strategies, so we are not overly sacrificing the quality of our education and pedagogy.

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May this global pandemic go away soon, so we can all continue our physical face-to-face teaching and learning with students, that we all miss! And may we continue to apply what we have learned and will learn through these unprecedented experiences, towards improving our standards of pedagogy – under whatever newly emerging social paradigms that await us in the future, as we continue to “build this plane,” together.

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