Readiness for the Next Disruption: Lessons From Instructors' Struggles During COVID-19

Modiu Olaguro
Virginia Tech

Estrella Johnson
Virginia Tech

Naneh Akparian
San Diego State University

Keywords: Crisis-readiness; Pandemic pedagogy, Emergency remote teaching, STEM instruction, Resilience theory

When higher education rapidly shifted online in 2020, instructors across STEM disciplines faced fundamental challenges. They include academic integrity concerns, inequitable access to technology, insufficient institutional training, unclear communication, and significant emotional strain (Daniel, 2020; Pokhrel & Chhetri, 2021). Using a national dataset of 934 chemistry, mathematics, and physics instructors' open-ended survey responses, this study investigates which pandemic-era challenges instructors faced during pandemic response teaching.

This poster is theoretically grounded in resilience theory (Hoiling, 1973; Norris et al., 2008). While it can be argued that undergraduate education has survived the pandemic, the disruption it ushered suggests that a strategy of survival is insufficient. To better prepare for the potential disruptions in the future, it is helpful to adopt a strategy of "community resilience" that integrates robustness, redundancy, resource mobilization, rapidity, communication, and social capital into a web of "adaptive capacities" (Norris et al., 2008, p. 127). Applying these frameworks to instructional systems, resilience is not simply the readiness to make the in-person-online transition on the outset of the next disruption. Rather, it is the extent to which such a move does not compromise academic integrity, dismantle professional communities, widen inequity, or encroach on student learning.

This study draws on text responses in a large-scale survey of STEM instructors across U.S. institutions. We conduct a qualitative thematic analysis focused on two research questions:

1. What pandemic-era instructional challenges did instructors face?
2. What capacities or structures did they identify as lacking?

Preliminary review reveals recurring themes: (a) insufficient technological preparation and emergency training; (b) academic integrity and assessment validity concerns; (c) lack of communication and unclear expectations; (d) inequitable access to devices, software, or stable internet; (e) emotional exhaustion and social isolation for both faculty and students; and (f) the need for departmental and institutional infrastructure that is proactive rather than reactive. These findings indicate that in addition to asking whether instructors can teach wholly online again, more focus should be on how they define readiness—technologically, pedagogically, institutionally, and psychologically. Findings can inform a framework that explicates fundamental criteria for emergency response teaching preparedness needed in STEM departments: rapid development of online assessments resistant to cheating, proactive instructor training, better communication systems, equitable access to digital tools, and structures that preserve community and belonging.

This poster contributes to the growing scholarship on lessons learned from COVID-19 by: (1) shifting the conversation toward future-focused resilience; (2) documenting instructors' own reflections on challenges; and (3) identifying the kinds of instructional, technological, and institutional capacities STEM that we can be investing in now.

Acknowledgements

This research was supported by National Science Foundation award numbers #2416741 and #2416742. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

References

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects, 49*(1), 91-96.

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1–23.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*(1-2), 127–150.

Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future, 8*(1), 133-141.