The (Re)adaptability of Research Methodologies in the Instructional Design & Technology Field

Enilda Romero-Hall¹ · E-Ling Hsiao² · Fei Gao³

Published online: 26 July 2018

© Association for Educational Communications & Technology 2018

In his revolutionary piece, *On The Origin of Species*, Darwin (1859) provided compelling evidence for the existence of the natural selection process. He described how species interact with their environments to cause variations in traits. Just like the species that Darwin explored in his research, the methodologies used in investigations related to the instructional design and technology (IDT) field have (re)adapted. This (re)adaptability serves to help us better inquire and explore the landscape of formal and informal educational learning environments available today.

In 1985, Howe published an article titled “*Two Dogmas of Educational Research*.” In this article, he advocated for post-positivist views in which researchers did not have to make a choice between value-laden, qualitative methods versus descriptive, quantitative methods. Instead, Howe (1985) stated there were no good reasons to avoid combination of methods. A few years later, other researchers continued to discuss the importance of qualitative research methods to provide findings that can be used to improve our understanding of learning, development, and education; these arguments were based on factors that affect the learning process such as individuals differences, chaos, and the role of freewill in human behavior, amongst others (Cziko 1989). These early reasonings and positions regarding educational research continued to evolve from the traditional views of research as experimentation versus the more realistic understanding of the complexities of educational

environments (Brown 1992; Schoenfeld 1992). This shift was not only focused on quantitative versus qualitative research, it was also a shift on location context (laboratories versus classrooms). Brown (1992) referred to this shift as a trade-off between experimental control and richness and reality.

Similar discussions related to methodologies also took place with educational researchers in the IDT field. For example, Winn (2002) provided a critical observation about experimental research in the IDT field. He stated that design experiments can be successful at determining effectiveness; however, just like Brown (1992), he clarified it can also provide distorted views in settings where variables cannot be *controlled*. In response to Winn’s (2002) article, Mayer (2003) wrote a seminal piece in which he expressed “research should be issue-driven, not method driven” (p. 362). Research methods should be selected based on specific hypothesis and research questions (Mayer 2003). In other words, research in the IDT field should vary based on the variables under examination.

These early arguments have had an impact in our academic discourse and use of research methodologies; they have helped us (re)adapt to changing environments. Today we understand the importance of mixed methods, the richness of qualitative inquiry, and the limitations of findings based on location context. However, as alternative learning environments emerge, our research questions evolve, and so do our research methodologies.

We, as researchers in IDT, continue to look at effectiveness and efficiency. Yet, learning environments such as online instruction (asynchronous, synchronous, massive open online courses), digital social communities, makerspaces, interactive virtual experiences, learning design studios, and others, provide an opportunity to investigate more than just knowledge acquisition. IDT researchers are asking questions related to: types of interactions, content created, geolocation, applicability to practice, benefits and challenges, learners’ and instructors’ experiences, to name a few. We are no longer solely interested in the learning outcomes, we also want to know how, when, where, and why learning occurs.

✉ Enilda Romero-Hall
eromerohall@ut.edu

E-Ling Hsiao
ehsiao@valdosta.edu

Fei Gao
gaof@bgsu.edu

¹ University of Tampa, Tampa, FL, USA

² Valdosta State University, Valdosta, GA, USA

³ Bowling Green State University, Bowling Green, KY, USA

Inside this Special Issue

In this issue of TechTrends, sponsored by the AECT Research and Theory Division, we aimed to focus on current innovative research methodologies in the IDT field. In these papers, researchers were rigorously using novel methods of data collection and analysis to advance knowledge in the field.

Research to Practice In the article “Action research experiences for scholarly practitioners in an online education doctorate program: Design, reality, and lessons learned,” Ismihan Arslan Ari, Fatih Ari, Michael M. Grant, and William Morris describe the design and techniques used by the Educational Technology program at the University of South Carolina to prepare scholarly practitioners with action research methods in the dissertation process of an online doctoral program. This article provides great insights and lessons learned through the process of empowering the students using action research. Given the rise and increasing number of IDT online master and doctoral programs, this article serves to aid program directors and faculty advising graduate students through a more practical thesis/dissertation research lens.

Brandy Brown Walker, Yuhua Lin, and Richard M. McCline wrote “Q-Methodology and Q-Perspectives® Online: Innovative research methodology and instructional technology” in which they aim to bridge the research/practitioner divide by creating an explicit merger of the learning and research environments. The authors outline how this methodology is suitable for research on perceptions of learning, efficacy of design, and technology adoption, among other topics. For researchers who are interested in this methodology, the article provides examples of the how Q Methodology in combination with Q-Perspectives® Online can serve to conduct real-time analysis in face-to-face, flipped and online classrooms.

Qualitative Research Online and Offline Attempting to support researchers and practitioners in the IDT field to conduct phenomenological research, Keri Valentine, Theodore Kopcha, and Mark Vagle wrote “Phenomenological methodologies in the field of educational communications and technology.” The authors describe the philosophical grounding and methodological variations of the more prominent approaches of phenomenological research (i.e., descriptive, interpretive, and post-intentional), as well as related issues and affordances. Central tenets of phenomenological research, such as lifeworld, attitudes, and intentionality are discussed. A critical element of this article is the illustration of IDT related research within this specific methodology, which allows us to gain an understanding of descriptive versus non-descriptive phenomenologies.

Jonathan Gratch and Scott Warren present a novel approach to qualitative research in the IDT field combining critical ethnography and cine-ethnography named *Critical CinéEthnographic*. In the article titled “Critical

CinéEthnographic methods: A new dimension for capturing the experience of learning in 21st century qualitative research,” Gratch and Warren discuss the communication and learning theories that are the backbone behind this ethnographic research approach. The authors provide step-by-step guidelines that assist researchers to a) capture through the use of digital tools the complex behaviors, powers dynamics, and process occurring in the learning environment and b) engage in the ethnographic critical reflection methodology.

“The embedded lesson approach to social media research: Researching online phenomena in an authentic offline setting” by Vanessa P. Dennen and Stacey A. Rutledge present a qualitative research methodology to gaining an understanding of a digital learning environment, social media. Most previous research that focused on learning and instruction within social media aimed to explore the behaviors of users and content shared within the different social media platforms. In this article, Dennen and Rutledge used an embedded lesson to investigate the use and impact of social media on learners within a school setting. The embedded lesson approach prevented concerns regarding the ethics, consent, and privacy of the data collected.

Data Mining Methods Royce Kimmons and George Veletsianos provide their expertise in the article “Public internet data mining methods in instructional design, educational technology, and online learning research.” In this article, the authors situate their discussion on studies, conducted by their research group, that have led to an understanding of the challenges and benefits of public data mining. Research on large datasets on public domain have posed a new opportunity for IDT topics. This methodology can lead to extracting knowledge and gaining an understanding on topics through complex, interdisciplinary, and multidimensional data. Kimmons and Veletsianos illustrate practical and methodological matters, as well as ethical guidelines that IDT researchers need to consider.

Another article that provides insights into public data mining methods, specifically to answer research questions related to geolocation of learners, was written by Spencer Greenhalgh, Bret Staudt Willet, Joshua Rosenberg, and Matthew J. Koehler. In “Tweet, and we shall find: Using digital methods to locate participants in educational hashtags,” the authors use a methodological foundation aiming to support the exploration of geographical issues in educational Twitter research. Methodological comparisons of machine learning and GPS coding are presented as well as human coding. The authors discuss the affordances and awareness that geolocation related research provides to the IDT field, such as locality and cultural learning context.

Physiological Research Methods In “A methodological case study with mobile eye-tracking of child interaction in a science museum” Yon Ju Jung, Heather Toomey Zimmerman, and Koralý Pérez-Edgar present a case on the use of mobile eye-

tracking to collect precise information concerning the learners' visual attention and interactions in an authentic environment. This study demonstrates a promising, active, and unique approach of mobile data collection, unlike traditional stationary eye-tracking in a laboratory environment using a computer.

Lin Lin Lipsmeyer and Thomas Parsons discuss core literature of media multitasking and its effect on learning in "Ecologically valid assessments of attention and learning engagement in media multitaskers." The authors discuss the complexity of research involving media multitaskers given the dynamics between learning concepts, theories, and frameworks. In this article, Lipsmeyer and Parsons describe new approaches, using electroencephalography and virtual reality, to test everyday multitasking behaviors and move backwards to assess how a succession of actions precede a behavior in everyday activities.

Taking a Bird's Eye View In the article "Meta-Analysis and Meta-Synthesis Methodologies: Rigorously piecing together research," Heather Home Leary and Andrew Walker review and illustrate meta-synthesis and meta-analysis procedures within the context of IDT research. These methodologies are often referred to as taking a bird's eye view. In this article, Leary and Walker address the importance of meta-synthesis and meta-analysis in providing trends and gaps in the literature about topics relevant to the field. They also discuss how these research methodologies allow us to evaluate and improve research. The article provides a great overview of traditional, as well as recent innovations and variations to these two types of research methodologies such as Bayesian Network Meta-analysis.

Looking Ahead

The articles in this special issue serve to represent a range of methodological research forms. We are aware there are other

emerging research methodologies used to explore IDT processes and outcomes. However, with this special issue, we aim to provide a range of articles that illustrate how: a) our research interest have changed, b) our research questions adjusted, and c) the methodologies we used to answer the questions have (re)adapted. Research has shown most studies published in IDT related journals present traditional quantitative and qualitative paradigms (West and Borup 2014). Our goal has been to promote, present, and disseminate articles that can aid other IDT researchers in their intent to address and investigate the evolving learning environments accessible today.

Acknowledgements We are grateful to the reviewers of the numerous manuscripts submitted to this special issue and to the *TechTrends* editorial team for their support in bringing this special issue to fruition.

References

- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of Learning Sciences*, 2(2), 141–178.
- Cziko, G. A. (1989). Unpredictability and indeterminism in human behavior: Arguments and implications for educational research. *Educational Researcher*, 18(3), 17–25.
- Darwin, C. (1859). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. London: John Murray.
- Howe, K. R. (1985). Two dogmas of educational research. *Educational Researcher*, 14(8), 10–18.
- Mayer, R. E. (2003). The case for evidence-based practice and issue-driven research. *Educational Psychology Review*, 15(4), 367–373.
- Schoenfeld, A. H. (1992). Research methods in and for the learning sciences. *The Journal of Learning Sciences*, 2(2), 141–178.
- West, R. E., & Borup, J. (2014). An analysis of a decade of research in 10 instructional design and technology journals. *British Journal of Educational Technology*, 45(4), 545–556. <https://doi.org/10.1111/bjet.12081>.
- Winn, W. (2002). Current trends in educational technology research: The study of learning environments. *Educational Psychology Review*, 14(3), 331–351.