

How research informs EdTech decision-making in higher education: the role of external research vs. internal research

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Introduction

According to the Association for Educational Communications and Technology (AECT), educational technology (EdTech) is “the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.”¹ In practice, EdTech is used to improve administrative efficiency, to increase access to educational opportunities, and to facilitate learning, for example, through adaptive learning or predictive analytics software. This study focuses on EdTech in the context of institutions of higher education (IHEs) and addresses the question: *Do EdTech decision-makers in higher education use research to inform decisions about acquiring and using EdTech to facilitate teaching and learning and, if so, how?*

Previous literature has documented whether and how research influences K-12 decision-makers (e.g., Asen, Gurke, Conners, Solomon, & Gumm, 2012; Finnigan, Daly, & Che, 2013). Integrating externally produced research into decision-making is difficult, since rigorous research may not be available, and even when it is, the findings need to be contextualized with “local data analyses, organizational history, and practice experience” (Tseng & Nutley, 2014, p.170). There is evidence that involving stakeholders in identifying educational needs and goals and in designing and conducting locally-relevant research and evaluation (what we term “internal research”) increases the likelihood of that the findings are used for decision-making (Anderson & Shattuck, 2012; Coburn & Penuel, 2016; Dede, 2005; Lewin, 1946; Penuel, Allen, Coburn, & Farrell, 2015; Penuel & Farrell, 2017; The Design-Based Research Collective, 2003).

Little comparable work has been conducted in higher education (Chaffee, 1983; Deming & Figlio, 2016; Ho, Dey, & Higson, 2006). With the exception of Acquaro (2017), almost none has specifically investigated use of evidence and research for decisions about EdTech. As investments in EdTech increase², it is important to understand how decision-makers use research, and how to improve these practices to ensure positive academic returns on EdTech investments.

Methods

Between September 2016 and April 2017, we conducted 45 semi-structured interviews (Merriam & Tisdell, 2015) with 50 EdTech decision-makers (CIOs, Directors of Digital or Online Learning etc.) from 42 IHEs. First, a purposive sample of IHEs was established by soliciting suggestions from participants in a symposium about EdTech efficacy research. Second, to address the lack of broad representation of IHEs in the purposive sample, we created a stratified random sample of institutions (2yr/4yr; public/private; for-profit/non-profit) from the

¹ <https://educationaltechnology.net/definitions-educational-technology/>

² <https://www.forbes.com/sites/nickmorrison/2017/05/09/google-leapfrogs-rivals-to-be-classroom-king/#32966ae927a6>

IPEDS database³. 33 IHEs from our purposive sample and 12 from the random sample agreed to participate in interviews.

Interview questions were based on the trajectory of rational decision-making processes (Simon, 1957) and assumed multiple criteria were used in decision-making (Zopoundis & Doumpos, 2017). We elicited information on what constitutes research, how research is used in decision-making, and whether IHEs conduct their own investigations into how well EdTech products work. Interviews were conducted face-to-face, by Skype or by phone. Transcripts of recordings and/or notes were coded in NVivo software, using a combination of deductive and inductive theming and coding techniques (Merriam & Tisdell, 2015).

Findings

All interviewees stated that they conduct research when making EdTech decisions, but their definitions of “research” varied widely. Activities that counted as research and the frequency with which each was mentioned are summarized in Table 1. We also indicate whether the research is external, i.e., conducted by a third-party, or internal, i.e., conducted by personnel within the institution. Decision-makers reported different research activities at various points in the decision-making process: to help identify potential EdTech products or strategies to address a pedagogical need, to find means of operationalizing these, and to conduct post-implementation investigations assessing impact on student outcomes.

Many interviewees described barriers to using research:

- The length of time it takes to complete research vs. the fast pace of technology change
- Differences in context between the research site and study population, and the decision-maker’s
- The dearth of rigorous research such as RCTs on EdTech products and strategies.

78% of interviewees reported conducting their own investigations of EdTech products. These studies varied widely in goals and methodological rigor with a few resulting in peer-reviewed publications, but most not being shared publicly. Results of these investigations were used to continuously improve instruction or to decide whether to continue or scale up use of the EdTech product or strategy. IHEs not undertaking such investigations cited constraints including costs, time, and capacity.

This paper will explore in detail several examples in which decision-makers conducted their own investigations, including:

- Using action research to understand how to increase student engagement and usage in online forums

³ [The Integrated Postsecondary Education Data System](#) is a system of interrelated surveys conducted annually by the U.S. Department of Education’s National Center for Education Statistics that gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs.

- Piloting personalized learning software through an in-house use-oriented action lab dedicated to EdTech research
- Collaborating with an EdTech vendor on a pre-post assessment of an adaptive learning platform to measure changes in student attitudes and learning outcomes.

Discussion

Our findings suggest that EdTech decision-makers in higher education rarely use externally-produced scientifically-based research to inform their decisions. They are more likely to produce and use their own locally-relevant evidence. This is consistent with previous research indicating that when decision-makers are involved in the design and conduct of research, the results are more likely to be used (Anderson & Shattuck, 2012; Lewin, 1946; Penuel & Farrell, 2017).

However, such investigations may lack rigor and result in less-than-ideal evidence for informing consequential decisions about investing in or scaling up often costly EdTech products and strategies. We recommend increased collaboration between researchers and EdTech decision-makers, either to render externally-produced scientific research more useful in practice, or to build capacity of decision-makers to produce more rigorous internal research. Concerted collaborations between researchers and practitioners in the design and implementation of both local and large-scale generalizable research about EdTech products and strategies should increase the usability and the rigor of research. In turn, this will improve the quality of evidence that influences EdTech decisions aimed at optimizing student learning.

Table 1. Types of activities named by interviewees as research they use or conduct related to EdTech products and strategies

Internally (I) or Externally (E) Produced	Activities that counted as research	Frequency with which this activity was mentioned (n=45)
I	Conducting student, staff, and faculty interviews, surveys, or focus groups about EdTech Issues	40%
I	Looking at student outcomes after implementing an EdTech strategy or product	38%
E	Reading industry, consortium, or trade publications, reports, or white papers about EdTech products	33%
I/E	Participating in site visits/asking peers or references what EdTech products they use and for feedback on products	31%
E	Reading vendor-provided information/literature/materials/white papers/case studies/efficacy studies	31%
I	Reviewing data analytics based on own technology platform or tool use data	24%
E	Reading forum, blog, or internet reviews about EdTech tools; gathering info. via social media; internet searches	24%
I	Conducting a pilot study in which an EdTech product or strategy is used by teachers and students	22%
E	Reading articles/reports/literature reviews/annotated bibliography/research materials on product (sources unspecified)	20%
E	Reading scholarly papers or journals about EdTech strategies	18%
I	Conducting investigations at own research centers or institutional research units on EdTech products or teaching and learning strategies	16%
I	Conducting comparison studies in which some teachers/students use EdTech product/strategy	16%
E	Conferring with consultants about EdTech products and strategies	13%

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