



Transforming disruptive technology into sustainable technology: understanding the front-end design of an online program at a brick-and-mortar university



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ABSTRACT

This article examines design processes that a team of instructional technology faculty and administrators experienced related to an online instructional technology graduate program at a large Midwestern university. This qualitative development research pays close attention to the five-year front-end program design. As participant observers, the first three authors reviewed faculty and administrator interviews, design meeting observations, and program related documents. The analysis relied on activity systems to showcase the disruptive nature of online education at a brick-and-mortar university and how faculty and administrators acted as entrepreneurial leaders. The implications from this study suggest that online education can bring disruptive influences to traditional university programs, but once faculty and administrators embrace the new opportunities and address uncertainties that online programs can bring to the sociohistorical context of their institution they are more likely to design and develop a successful program.

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1. Introduction

The goal of this article is to examine how a team of Instructional Technology (IT) faculty and administrators navigated challenges associated with online program development as entrepreneurial leaders at a traditional brick-and-mortar university. We specifically examined the five-year front-end design period, which was when faculty and administrators actively engaged in program design together. We focused on front-end design because that was when faculty and administrators confronted the disruptive influences of online education, and turned those influences into opportunities for new program development.

Examining online program development from this perspective will help faculty and administrators understand how online programs cannot be simply developed as an extension to traditional brick-and-mortar university teaching and curricular practices. Instead, online program design and development requires the identification and development of newly organized social structures to address disruptive forces often associated to it. The program we examined was initially launched in October 2010 as the Technology Specialist Online Program (TS Online) at a large Midwestern university. Since its launch, this program has been

consistently recognized as one of the best online education programs by the US News and World Report Online Graduate Education rankings.

The first three authors of this article took a critical role in the program and engaged in this research as participant observers. The primary research question of this investigation was: How did online education as a disruptive technology within the sociohistorical context of a brick-and-mortar university bring about opportunities and uncertainties that shaped faculty and administrator participation in online program development? We addressed this question by reviewing faculty and administrator interviews, observations from design meetings, reviewing program related documents, and by engaging in retrospective design reflections during data collection, analysis, and the writing of this article.

While addressing the research question, we relied on the theoretical and analytical constructs related to disruptive technology, entrepreneurial leadership, and activity systems analysis. We identified online learning as a disruptive technology within higher education, which helped us understand how the situations we encountered within a traditional university structure were inevitable challenges we were destined to navigate. We relied on activity systems analysis to identify how specific preexisting institutional, historical, and community shared policies and expectations as well as newly created expectations and opportunities influenced the program design.

This work will help instructional designers see how program design and development is an organic process that is shaped by their social environment. This work adds value to current research related to the design and development of online education by examining how online

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programs do not necessarily fit into day-to-day operations of a brick-and-mortar university. This work will help faculty and administrators assess the opportunities and roadblocks within their institution that can influence online program development. This work can also help faculty and administrators identify how to create new workspaces within existing social structures that can optimize innovative online programs.

2. Online education as a disruptive technology in higher education

When referring to disruptive technology we relied on Bower and Christensen's (1995) observation related to sustaining and disruptive technology where sustaining technology may help an organization to stay successful by maintaining steady improvements and keeping customers happy and disruptive technology can introduce an entirely new market of services and lead to a failure of the mainstream approach to business (Danneels, 2004). For a well-established organization, disruptive technology may initially seem utterly inconsequential to the mainstream way of doing things (Christensen, 1997). Even with its initial poor performance, over time as new technological advances come to place disruptive technology can grow the potential for the general public to fundamentally question the way things have always been done and anticipate or demand better services that traditional methods cannot provide (Akbar & Tzokas, 2013).

Zeleny (2012) introduced an idea that helps understand how newly introduced technologies can become disruptive in established organizations. He explained disruptive technology within the context of Technology Support Net (TSN) and defined TSN as:

The requisite physical, organizational, administrative and cultural structures: work rules, task rules, requisite skills, work content, standards and measures, styles, culture and organizational patterns (p. 443).

In his explanation, technologies on their own as an artifact do not bring disruptive influences to an organization, but technologies within the context of a TSN brings about disruptive influences to historically established organizational practices.

Online education is a disruptive technology in public higher education. It puts into question whether the traditional lecture based face-to-face course offerings is the best and only approach to provide learning experiences to students (Archer, Garrison, & Anderson, 1999). For example, the ability for the general public to be able to engage in educational experiences relying on information exchange that can be facilitated any time from anywhere with a push of a button has stripped universities from their power of being the exclusive knowledge provider to the public (Gibb, Haskins, & Robertson, 2013). Online education is disruptive because it raises questions among the public regarding traditional brick-and-mortar university services by (a) providing new opportunities to a large number of students who otherwise would have not have access to higher education, and (b) by making the structures that support student services at a brick-and-mortar institution look incompatible for providing services to the newly identified students who want access to higher education (Christensen, Horn, Caldera, & Soares, 2011).

3. Entrepreneurial leadership in higher education

When addressing disruptive technology university faculty and administrators need to be entrepreneurial leaders and help their colleagues become innovative risk takers without harming their own careers or programs in the process (Gupta, MacMillan, & Surie, 2004; Reimers-Hild & King, 2009). Entrepreneurial leaders help their organization take necessary risks to develop new activities that can tap into future growth potential a disruptive technology can introduce to their organization. Entrepreneurial leaders typically have been characterized as a single heroic individual, but more recently there have been discussions about how entrepreneurial leadership can be distributed involving

various actors and series of human activities within organizations (Jones & Crompton, 2009; Pellinen, 2014). Therefore, entrepreneurial leadership is part of a complex system composed of human activity and the organizational context in which those activities take place and co-evolve (Shepherd, Patzelt, & Haynie, 2010).

Entrepreneurial leaders discover or create opportunities for their unit to engage in innovative activities. (Dyer, Gregersen, & Christensen, 2008). They can somehow see unique opportunities in the midst of situations that others see chaos, contradiction, and confusion (Kuratko, 2007). An entrepreneurial leader needs to help others to take part in this process as well as be autonomous and proactive about identifying and acting on future opportunities (Okudan & Rzasa, 2006).

In terms of online education in public universities faculty need to be part of an entrepreneurial leadership team and help each other to see beyond the disruptive influences innovations have on their traditional teaching practices. Higher education faculty and administrators need to understand what are the factors in the existing structure of their institution that can act as barriers and motivators for faculty to teach online (Bruner, 2007; Maguire, 2005). When working with specific technology, faculty and administrators need to understand and be patient of the complex adoption process they will experience while adapting their daily practice to integrate new tools into their teaching (West, Waddoups, & Graham, 2007). Administrators need to examine what are the unique planning and management resources that faculty need for developing online courses. (Care & Scanlan, 2001). They also need to examine how their work as university leaders needs to change to provide the support and resources necessary for faculty to engage in online course development (Schauer, Rockwell, Fritz, & Marx, 2005).

4. Capturing the effects of disruptive technology and its socio-historical context as a series of human activities with activity systems analysis

Activity systems analysis is an analytical framework that originated from Vygotsky and scholars interested in Cultural Historical Activity Theory (CHAT) (Yamagata-Lynch, 2010). The unit of analysis in CHAT research is human activity, which includes both mental and observable activities in its historical and situational context (Galperin, 1992; Leontiev, 1981). This type of analysis is relevant to instructional design and technology because there are increasing number of authors who are interested in the social historical contextual factors that influence the design and development of learning environments (Collis & Margaryan, 2004). Activity systems analysis helps researchers and practitioners zoom in and out of the broad historical and situational design contexts as well as the intricate details of a design activity (Jonassen & Rohrer-Murphy, 1999). It gives an analytical perspective for design researchers and practitioners to make sense of how design works in real-world complex situations (Yamagata-Lynch, 2014).

Activity systems analysis breaks complex human activity to systematically analyze the whole activity (Arievitch, 2008). Human activity by nature is rather chaotic, and activity systems analysis provides a snapshot of the chaos while highlighting how innovations affect existing practices (Cole & Engeström, 1993). It helps researchers uncover tensions or disruptions in human activities that can act as the reason for participants to change their practice or choose to no longer participate in an activity (Engeström, 1993).

In Engeström's (1987, 1993) work, activity systems include subject, tool, object, rules, community, distribution of labor, and outcomes (Fig. 1). Subjects are participants of an activity and tools are the resources that subjects use to obtain the object or the goal. Rules can be policies, procedures, and beliefs that subjects are compelled to follow while engaging in an activity. The community is the group that subjects belong to and the division of labor is the shared responsibilities determined by the community. Finally, the outcome is the consequences that the subject faces as a result of the activity. Any component of an activity system can bring about tension in the subject's effort to attain the object. Tensions

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