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About the Journal

During the past 50 years, journals in the field of instructional design have been responsive to the changing needs of both scholars and to a lesser degree, the practitioner. We have seen an evolution of AVCR to ECTJ, the emergence of JID, and finally the merging of ECTJ and JID to form ETR&D. ETR&D is a widely recognized, scholarly journal in our field that maintains rigorous standards for publications.

During the past 50 years, we have also witnessed a change in the field due in part to the success of instructional design in business and other nonschool environments. The number of instructional designers working outside the university has dramatically increased. Of particular importance is the rise in the number of instructional designers with doctorates who consider themselves practitioners, but not necessarily scholars. This growing group of designers might be best described as reflective practitioners who can make a significant contribution to the knowledge of our field.

This growth and success in the application of instructional design has also changed the field. From the early days of the field until the mid-1980's, the theory and practice of instructional design was almost exclusively influenced by the academic community. With the growth of instructional designers, the theory and practice of the field is now defined by both academics and practitioners. There is a need for greater communication between the scholars and the practitioners in a scholarly journal that will support innovation and growth of our knowledge base.

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Goals

The purpose of this journal is to bridge the gap between theory and practice by providing reflective practitioners a means for publishing articles related to the field. The journal establishes and maintains a scholarly standard with the appropriate rigor for articles based on design and development projects. Articles include evaluation reports (summative and formative), lessons learned, design and development approaches, as well as applied research. The articles are based on design and development projects as opposed to pure research projects and focus on lessons learned and how to improve the instructional design process. Rigor is established through articles grounded in research and theory.

A secondary goal of this journal is to encourage and nurture the development of the reflective practitioner in the field of instructional design. This journal encourages the practitioner as well as collaborations between academics and practitioners as a means of disseminating and developing new ideas in instructional design. The resulting articles inform both the study and practice of instructional design.

Philosophy

This journal will provide a peer-reviewed format for the publication of scholarly articles in the field of applied instructional design. The journal recognizes the role of the practitioner in the work environment and realizes that outside constraints may limit the data collection and analysis process in applied settings. The limitations of real-world instructional design of the practitioner can still provide valuable knowledge for the field.

Sponsoring Organization

JAID is a publication of the Association for Educational Communications and Technology (AECT).

JAID is an online open-access journal and is offered without cost to users.

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About AECT

The Association for Educational Communications and Technology (AECT) is a professional association of instructional designers, educators and professionals who provide leadership and advise policy makers in order to sustain a continuous effort to enrich teaching and learning. Seizing opportunities to raise awareness and leverage technology, our members may be found around the world in colleges and universities, in the Armed Forces and industry, in museums, libraries, and hospitals, and in the many places where educational change is underway. Our research and scholarly activity contribute to the knowledge base in the field of Learning. We are on the cutting edge of new developments and innovations in research and application.

AECT is the premier organization for those actively involved in the design of instruction and a systematic approach to learning. We provide an international forum for the exchange and dissemination of ideas for our members and for target audiences. We are the national and international voice for improvement of instruction and the most recognized association of information concerning a wide range of instructional and educational technology. We have 24 state and six International Affiliates all passionate about finding better ways to help people learn.

Since 1923, AECT has been the professional home for this field of interest and has continuously maintained a central position in the field, promoting high standards, in both scholarship and practice with nine Divisions and a Graduate Student Assembly that represent the breadth and depth of the field. Other journals sponsored by AECT include *Educational Technology Research and Development* and *TechTrends*.

The Journal of Applied Instructional Design (JAID) is a refereed online journal designed for the publication of scholarly articles in the field of applied Instructional Design. The purpose of JAID is to provide the reflective ID scholar-practitioners and researchers a means for publishing articles on the nature and practice of ID that will support the innovation and growth of our knowledge base. The journal is for practitioners, instructors, students, and researchers of instructional design.

Call for Submissions

JAID is for reflective scholar-practitioners, who through documentation of their practice in ID, make significant contributions to the knowledge of our field. Authors are invited to submit articles documenting new or revised approaches to ID; the processes of ID including in-depth documentation of analysis, design, and development, implementation and evaluation; design-based research; as well as applied research. Articles must be based on instructional design projects as opposed to pure research projects and focus on documented processes, lessons learned, and how to improve the overall process of ID. Articles must be grounded in research and theory connecting the intellectual foundations of the ID field and how these foundations shape its practice.

The journal will establish and maintain a scholarly standard with the appropriate rigor for articles based on design and development projects. A secondary goal of this journal is to encourage and nurture the development of the reflective practitioner in the field of ID. This journal encourages the practitioner as well as collaborations between academics and practitioners as a means of disseminating and developing new ideas in ID. The resulting articles should inform both the study and practice of ID.

Submit an Article

Article Types

JAID currently accepts submissions of three article types.

Instructional Design Practice

This is an applied journal serving a practicing community. Our focus is on what practitioners are doing in authentic contexts and their observed results. These articles cover topics of broad concern to instructional design practitioners. The articles should represent issues of practical importance to working designers.

Research Studies on Applied Instructional Design

JAID is interested in publishing empirical studies exploring the application of instructional design principles in applied settings. Quantitative and qualitative studies are welcome.

Instructional Design/Performance Design Position Papers

JAID also accepts position papers that attempt to bridge theory and practice. Examples may include conceptual frameworks and new ideas facing the instructional design community. The paper must also provide enough information to allow the replication of the innovation or continuation of the research in other settings. Position papers must be based in the context of a theoretical framework. Efficacy data is strongly preferred, but not always required, contingent upon the potential generalizability or value of the innovation.

Submission Guidelines

The journal will focus on in-depth applications of the ID process and publish a variety of articles including case studies of the ID process; application articles that go beyond a mere how-to approach that provide implementation insights, guidance and evaluation of a process; evaluation articles that focus on the viability of a product or process; applied research resulting from evaluation of materials, studies of project implementation, articles on ways to improve the ID process from the perspective of the practitioner, and short essays that provide a scholarly debate of relevant issues related to the application of ID and relevant book reviews. When applicable, articles should include supplementary materials including examples of ID products, evaluation instruments, media files, and design artifacts.

The articles in the journal will be from the perspective of the scholar-practitioner rather than from the researcher. However, the manuscripts must demonstrate scholarly rigor appropriate to applied manuscripts.

Articles, including tables or figures, must follow APA 7th edition formatting and be submitted in a word or doc format using at least 12-point New Times Roman font. Each article must have an abstract (75-100 words) and a list of keywords. While there is some flexibility in the length of an article, 4,000 to 5,000 words is a best-guess estimate. If in doubt, contact the editor prior to submitting the article. Identifying information must only be located on the cover page including contact information for the first author.

You may contact the editors via email, if you have further questions.

Contact the Editor

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Instructional Designers in Higher Education: Roles, Challenges, and Supports

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THE JOURNAL OF APPLIED INSTRUCTIONAL DESIGN

Instructional designers (IDs) play a crucial role in higher education institutions' teaching and learning endeavors. This review of literature on IDs in higher education between 2000 and 2020 found that their roles, responsibilities, and challenges are well-described, but little is known about what supports them. As ID roles evolve in response to new challenges while helping faculty and institutions adapt to changes during and after the COVID-19 pandemic, there is a rapidly emerging need to focus on additional areas of research, such as faculty perspectives, what it means to be an ID, and how IDs are--or can be--supported.

Introduction

Instructional design has been defined by Reiser (2001) as a practice that "encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance" (p. 1). This definition points at the core purpose of instructional design and development activities but is not a sufficient description of what it is to be an instructional designer (ID), especially in the context of college or university employment. Instructional designers are increasingly present on higher education campuses, and published literature provides a solid foundation for understanding their education, competencies, and responsibilities (Kenny et al., 2005; Kumar & Ritzhaupt, 2017; Intentional Futures, 2016; Ritzhaupt & Kumar, 2015). The literature also suggests that instructional designers do more than engaging in systematic processes to design instruction: they develop teaching and learning materials alongside faculty subject matter experts, they support online learning technologies, they evaluate course and program quality, they train others, they manage collaborations, and they interface with students as facilitators, helpdesk staff, or background support (Dykstra, 2020; Intentional Futures, 2016). Yet, as much as is known, research has only just begun to explore the challenges IDs face in their roles in higher education, and where they find, or need, support.

The already rapid pace of change relative to technologies for teaching and learning in higher education has been accelerated during the COVID-19 pandemic in the US. Almost overnight, in March 2020 higher education institutions mandated sweeping shifts in educational delivery methods, activating widespread emergency remote teaching methods to replace face-to-face instruction (Hodges et al., 2020). Over a year later the need for ongoing remote or blended/hybrid teaching continues and brings with it ongoing and significant demand for the expertise and support of IDs as a resource to enable faculty instructors to "keep teaching" ("Keep Teaching," 2020, n.p.).

Research Purpose

This literature review seeks to understand what has been learned from and about IDs in higher education between 2000-2020 as a way to contextualize the challenges faced by IDs and the support they need, given the long-term effects on the profession post-COVID-19. Shining light on the holes in this knowledge—critiquing gaps and problems in the literature as advised by Torraco (2016)—can also illuminate areas of study that warrant deeper attention in the future. The following research questions guided this study:

1. What are the roles and responsibilities of IDs in higher education?
2. What are the challenges faced by IDs in higher education?
3. What supports are utilized by IDs working in higher education?

Methods

The literature search was conducted in ERIC, Google Scholar, and a US university library-provided combined search tool that accessed EBSCO, DOAJ, JSTOR, and SpringerLink. The following terms were searched: instructional designers, instructional designer, higher education, college, university, IDs, educational technologists, course designers, learning design, learning designer. These were combined in various ways to cast a wide net. Results included peer-reviewed journal articles, book chapters, dissertations, white papers, and other sources that were collected and cataloged in a spreadsheet. The spreadsheet highlighted key information: author(s), year of publication, study context, publication type, publication name (if applicable), focus, main findings, type of research (qualitative/quantitative/mixed), methodology (when available), and data sources. Additional chain searching and collection was conducted as articles cited potentially relevant studies that had not appeared within search results. The following inclusion criteria were applied to the 76 sources collected:

- Literature that focused on the experiences and/or activities of IDs in their professional roles rather than on design outcomes, training students to be IDs, student learning, or technological implementations was included. Faculty perspectives on working with IDs, though rare, were included.
- Sources that specifically referred to a higher education context for at least half the study participants were included.
- Only peer-reviewed articles, peer-reviewed conference proceedings, peer-reviewed books, and dissertations were included; non-peer-reviewed books and non-peer-reviewed articles were excluded.
- In addition to empirical research, literature reviews, conceptual, and position papers in peer-reviewed journals were included.

The above inclusion criteria resulted in 50 peer-reviewed articles, from 31 worldwide scholarly sources. After articles were read and selected for inclusion, they were re-read closely for powerful and salient ideas surrounding IDs in higher education that addressed the research questions. Direct quotes were collected and first open coded by asking, "What is this about?" As a second stage of analysis of preliminary findings, these codes were grouped by topic, similar codes were merged, and topics were finally organized such that four thematic categorizations resulted: study characteristics and research approaches; roles and responsibilities of IDs; challenges faced by IDs; and what supports IDs in higher education. In this way, the research questions were used as a framework to guide the inquiry into relevant themes and findings within each study. At several points during analysis, articles were re-read for clarification and to ensure that

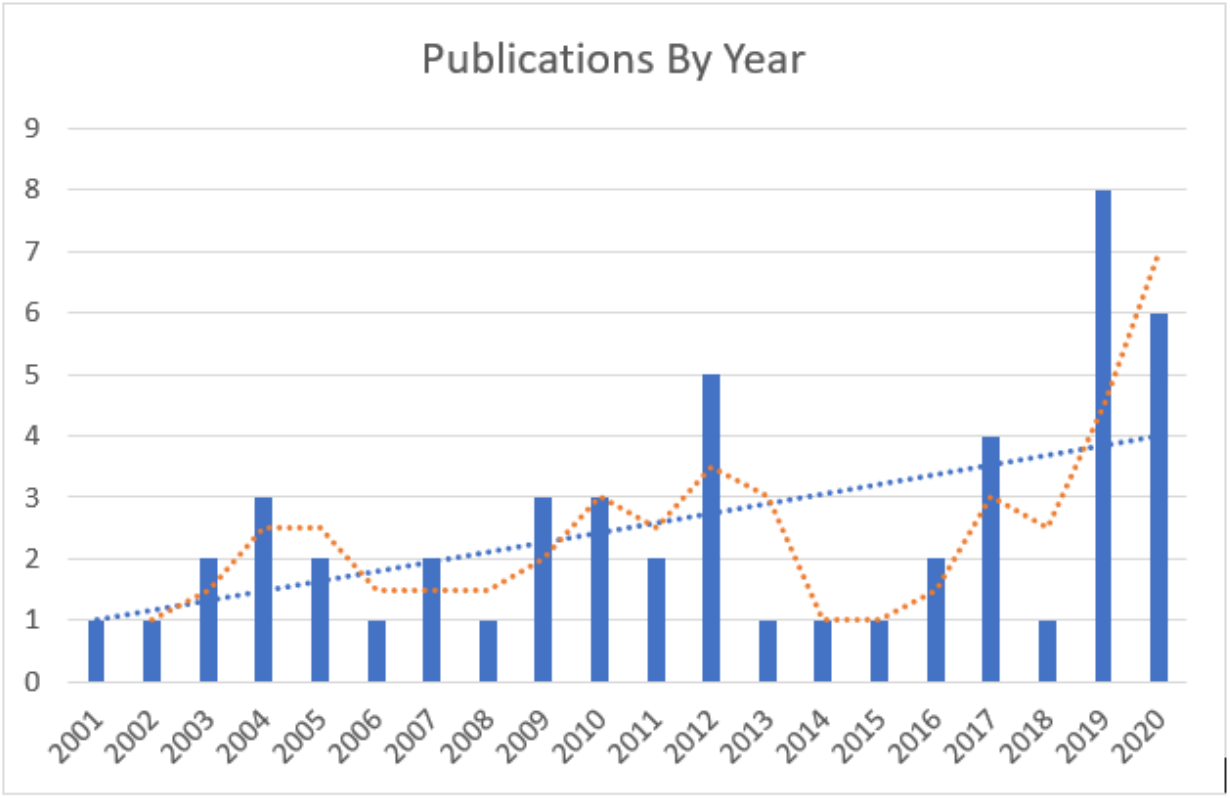
faithful representation of the original study was achieved via the selected quotation(s). Additionally, all data collected in spreadsheet form, including quotes, and themes, were reviewed by both authors for consistency and integrity.

Findings

Publications on IDs in higher education between 2000-2020 have been trending upward overall (Figure 1). Although there were several years in which only a single study was published, the number of publications peaked in 2012 (n=5) and was nearly double that in 2019 (n=8). It appears that between 2015 and 2020, this topic has seen a sharper upward trend than during any previous period from 2000-2020.

Figure 1

Number of Publications by Year, 2001-2020



Graph showing the number of publications per year

The number of publications in publication sources are detailed in Table 1 below, with the exception of four dissertations published by: Capella University (2), Liberty University (1), and the University of Nebraska – Lincoln (1).

Table 1

Publication Sources and Authors

Publication Source	Count	Author(s), Date
Annual Proceedings of Selected Research and Development Presented at the National Convention of the Association for Educational Communications and Technology	1	McGriff, 2001
Australasian Journal of Educational Technology	2	Campbell, Schwier, & Kenny, 2005; Schwier, Campbell, & Kenny, 2004

Publication Source	Count	Author(s), Date
Canadian Journal of Learning and Technology	2	Dicks & Ives, 2009; Kenny, Zhang, Schwier, & Campbell, 2005
Contemporary Educational Technology	1	Schwier & Wilson, 2010
Digitale Medien: Zusammenarbeit in der Bildung	1	Obexer & Giardina, 2016
Proceedings of ED-MEDIA--World Conference on Educational Multimedia, Hypermedia & Telecommunications	1	Keppell, 2004
Education and Information Technologies	1	Ren, 2019
Educational Technology Research and Development	5	Campbell, Schwier, & Kenny, 2009; Hoard, Stefaniak, Baaki, & Draper, 2019; Richardson, Ashby, Alshammari, Cheng, Johnson, Krause, Lee, Randolph, & Wang, 2019; Sheehan & Johnson, 2012; Tracey, Hutchinson, & Grzebyk, 2014
Educause Review	1	Miller & Stein, 2016
Proceedings of E-Learn--World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education	3	Salentiny, 2012; Surrency, Churchill, Sanchez, & Scott, 2019; You & Teclehaimanot, 2010
Handbook of Research on Educational Communications and Technology	1	Sims & Kozalka, 2008
Instructional Design: Case Studies in Communities of Practice	1	Schwier, Campbell, & Kenny, 2007
International Journal of E-Learning & Distance Education	1	Cowie & Nichols, 2010
International Education Studies	1	Park & Luo, 2017
International Journal of Educational and Pedagogical Sciences	1	Brito, 2017
International Journal on E-Learning	1	Kumar & Ritzhaupt, 2017
Journal of Applied Instructional Design	3	Bond & Dirkin, 2020; Mancilla & Frey, 2020; Ritzhaupt, Stefaniak, Conklin, & Budhrani, 2020
Journal of Educational Technology Development and Exchange	1	Pan & Thompson, 2009
Journal of Learning Design	1	Campbell, Schwier, & Kenny, 2006
Medical Science Educator	1	Anderson, Love, & Haggar, 2019
Online Journal of Distance Learning Administration	2	Chongwony, Gardner, & Tope, 2020; Shaw, 2012
Online Learning	1	Drysdale, 2019
Open Learning: The Journal of Open, Distance and e-Learning	1	Fyle, Moseley, & Hayes, 2012
Open Praxis	1	Morgan, 2019
Optimizing Instructional Design Methods in Higher Education	1	Vovides & Lemus, 2019
Performance Improvement	1	Brigance, 2011
Performance Improvement Quarterly	3	Chen & Carliner, 2020; Kirschner, Carr, Van Merrienboer, & Sloep, 2002; Ritzhaupt & Kumar, 2015
Proceedings of the 21st Ascilite Conference	1	Bird, 2004
Qualitative Report	1	Bawa & Wilson, 2017
Quarterly Review of Distance Education	2	Ashbaugh, 2013; Pan, Deets, Phillips, & Cornell, 2003
TechTrends	1	Cox & Osguthorpe, 2003

Thirty-three studies included in this review had a US context, i.e., the context of the study or the researcher (in the case of a position paper or literature review) was US-based. Two studies involved participants in the US and Canada, eight studies were entirely Canada-based, two were conducted in the UK/Europe, four were Australasian, and one was conducted in Hong Kong. education.

Researchers studying IDs in higher education in this review took a primarily qualitative approach (n=29) using a variety of methods (Table 2). Interviews, conversations, focus groups, and emails were most common sources of data, with a few studies using job postings, design tasks, and observations. Mixed methods were used in six publications, primarily consisting of surveys with both quantitative and qualitative aspects; there were only three entirely quantitative studies.

Nine position or conceptual papers, which did not indicate a methodology or approach, and three literature reviews were included.

Table 2

Research Methodologies in Included Studies

Primary Approach	Count	Methodology	Count
Qualitative	29	Case Studies	7
		General Qualitative	7
		Phenomenological	5
		Narrative	3
		Content/Document Analysis	3
		Grounded Theory	1
		Modified Delphi	1
		“Interpretive”	1
		“Contextual Inquiry”	1
Quantitative	3	Survey	2
		Web Application Questionnaire	1
Mixed Methods	6	Survey	5
		Case Study	1
Position or Conceptual	9	No specific methodology	9
Literature Review	3	Integrative	1
		No specific methodology	2

Roles and Responsibilities

An ID working in a college or university setting serves multiple stakeholders at once: the institution, the faculty/instructor and/or subject-matter expert (SME), and ultimately the learner (Kirschner et al., 2002; Ritzhaupt & Kumar, 2015). The terms faculty/instructor and the subject-matter expert (SME) were found to be synonymous in the literature reviewed and are therefore referred to as faculty SMEs in this article.

Functional Responsibilities

Several studies pointed out the variety of backgrounds and career paths that lead to becoming an ID in higher education. In general, these IDs are highly and diversely qualified, often possess backgrounds in teaching, and frequently consider their professions *found* as opposed to *sought*; rather than taking a path through a degree or other training in order to become an ID, they find their way into those roles as a result of their experiences and skill sets (Anderson et al., 2019; Kenny et al., 2005; Ritzhaupt & Kumar, 2015; Schwier et al., 2004). In a fitting parallel to these entry paths to instructional-design-as-career, the job titles, roles, and functions of IDs in higher education are similarly variable (Anderson et al., 2019; Morgan, 2019; Moskal, 2012; Schwier & Wilson, 2010). Because the practice of instructional design cannot be separated from the environment in which it takes place, the culture of the institution is a strong influence in how and what its IDs do (Dykstra, 2020; Pan et al., 2003; Schwier et al., 2004; Sims & Koszalka, 2008). Pan & Thompson (2003) note there is often a “balance between the prevailing bureaucracy and the

implementation of innovative uses of instructional design" (p. 166) which may constrain or enable pedagogical possibilities at a given institution.

Surrency et al. (2019) analyzed job postings for IDs in higher education and found that 90% listed soft skills—especially communication skills--as a required competency; Chongwony et al. (2020) noted in a similar job posting analysis that "the most mentioned competency is communication skills" (n.p.). However, most studies included in this review conceptualized ID responsibilities in the form of what they do for faculty, for learners, and for education and instruction in practice, rather than cataloging their position descriptions. These functional elements of ID roles tend to include predictable responsibilities such as: (a) applying instructional design theory and models to educational projects (Kenny et al., 2005; Ritzhaupt & Kumar, 2015; Schwier et al., 2007); (b) helping faculty teach (Anderson et al., 2019; Hart, 2018; Kumar & Ritzhaupt, 2017; Miller & Stein, 2016; Pan & Thompson, 2009); (c) providing technological support (Kumar & Ritzhaupt, 2017; Park & Luo, 2017; You & Teclehaimanot, 2010); (d) managing projects (Cowie & Nichols, 2010; Cox & Osguthorpe, 2003; Kumar & Ritzhaupt, 2017); (e) collaborating and communicating (Bawa & Watson, 2017; Drysdale, 2019; Hart, 2018; Moskal, 2012; Richardson et al., 2019; Schwier & Wilson, 2010); and (f) providing opportunities for faculty development (Hart, 2018; McGriff, 2001; McDonald & Mayes, 2007; Moskal, 2012). Increasingly, IDs in higher education are also expected to ensure educational quality and innovation (Brito, 2017), and understand how to conduct evidence-based activities using research (Ashbaugh, 2013).

In the context of higher education, instructional design is inherently collaborative, often referred to in terms of being socially-constructed: as relationships or conversations (Campbell et al., 2005; Chen & Carliner, 2020; Drysdale, 2019; Dysktra, 2020), using a "common vocabulary . . . [or] language" (Chen & Carliner, 2020, p. 482). IDs bring value to the collaborative effort of course design and development, aiding faculty in the transformation of their teaching strategies to incorporate best practices in technology application, pedagogy, ethics, accessibility, and learner-centered design (Brigance, 2011; McDonald & Mayes, 2007). Although IDs are most directly supporting and collaborating with faculty, they nonetheless acknowledge that learners are ultimately whom they serve (Dykstra, 2020; Kirschner et al., 2002; Kumar & Ritzhaupt, 2017). Importantly, IDs use reflective and creative thinking to find new ways of solving problems as a matter of routine (Ren, 2019; Schwier et al., 2007; Tracey et al., 2014). Their role in linking faculty SMEs to learners positions them in a space of unique potential to create a unified connection between the two (Dicks & Ives, 2009). As Fyle et al. (2012) noted, "IDs can be the glue, holding everything together as project manager, as well as providing support and assistance throughout the process – brokering the services of others as needed" (p. 62).

Although technological support was noted as a prevailing reason faculty engage with IDs (Kumar & Ritzhaupt, 2017), what they needed more was pedagogical perspective and meaningful instructional problem-solving (You & Teclehaimanot, 2010). Fittingly, IDs were distinguished in the literature from information technologists precisely because their technological perspective is focused on how to use those technologies to teach (Kumar & Ritzhaupt, 2017). Their knowledge is both practical and theoretical, and their value lies in transcending the technology to put it to meaningful use in pragmatic ways, often to reduce the burden and learning curve for faculty SMEs (Ritzhaupt & Kumar, 2015; Schwier et al., 2007; Sheehan & Johnson, 2012). Several studies found that, although IDs report using traditional models of instructional design (especially ADDIE), their application is not universal (Bond & Dirkin, 2020; Kenny et al., 2005; Schwier et al., 2007; Tracey et al., 2014).

Characteristics, Not Roles

Focusing on what "instructional designers really do" (Kumar & Ritzhaupt, 2017, p. 371), studies frequently opted to characterize IDs in terms of who they are as actors and agents. IDs were referred to as:

- Brokers (Fyle et al., 2012; Mayes, 2002; McDonald & Mayes, 2007),
- Problem solvers (Ritzhaupt & Kumar, 2015; Park & Luo, 2017; Shaw, 2012; Schwier et al., 2004),
- Change agents (Anderson et al., 2019; Ashbaugh, 2013; Campbell et al., 2006; Campbell et al., 2009; McDonald & Mayes, 2007; McGriff, 2001; Ren, 2019; Shaw, 2012; Schwier et al., 2004),
- Curious or inquisitive and willing to learn (Dykstra, 2020; Keppell, 2004; Ritzhaupt & Kumar, 2015), and
- Reflective (Pan & Thompson, 2009; Tracey et al., 2014).

If relationships are viewed as the center of instructional design (Chen & Carliner, 2020; Dicks & Ives, 2009; Drysdale, 2019) and if instructional design is a conversation (Campbell et al., 2006; Schwier et al., 2007), then perceived or enacted characteristics may be a more relevant construct than role when considering how IDs carry out their work in higher education.

"Unsung essential functions" (Anderson et al., 2019, p. 510)

Aside from the responsibilities detailed above and the range of functions they provide to learners, instructors, and institutions of higher education, IDs must also navigate a variety of poorly-defined, yet crucial, demands on their skill sets in order to be successful in higher education (Mancilla & Frey, 2020). They must be able to reflect, adapt, problem-solve, and innovate all while managing and brokering successful interpersonal collaboration with SMEs who hold authority but not necessarily expertise in teaching (Chen & Carliner, 2020).

IDs must be skilled at building and maintaining relationships (Chen & Carliner, 2020; Cowie & Nichols, 2010; Dicks & Ives, 2009; Ritzhaupt & Kumar, 2015), sometimes leading and sometimes supporting, depending on the needs of the interaction (Pan et al., 2003). Listening skills must be coupled with an ability to "tease out" (Dicks & Ives, 2009, n.p.; McDonald & Mayes, 2007, p. 176) the core of an educational problem not only to propose working solutions, but also to convince the faculty SME that the solution is both viable and reasonable to implement. Intuition and sensitivity to multiple levels of interpersonal and professional dynamics is important because IDs' jobs are complex, "involving symbiosis with not only other human beings, but also with technology and content" (Bawa & Watson, 2017, p. 2337). Often, the ID is in a position of needing to impose policy on educational delivery projects, and thus they must have firm grounding in the ethical-, accessibility-, and academic integrity-related expectations and regulations at their employing institution as well as nationally (Kumar & Ritzhaupt, 2017; Sims & Koszalka, 2008). Dicks and Ives (2009) go so far as to describe IDs as the "instructional conscience" (n.p.) ensuring alignment between educational intention and pedagogical practice, but this is sometimes extended to functioning as a socio-political, ethical, and institutional value conscience as well (Campbell et al., 2006; Schwier, et al., 2007).

Because they are the facilitators, the brokers, and even the glue that holds together technology, content, and pedagogical best practice, IDs are integral to the quality and success of education (Anderson et al., 2019; Ashbaugh, 2013; Campbell et al., 2006; McDonald & Mayes, 2007; Schwier et al., 2007). Researchers argue that there is an emerging trend in higher education in which IDs function as change agents, increasingly responsible for facilitating discussions concerning technology-enhanced learning initiatives and challenging the pedagogical status quo (McDonald & Mayes, 2007; Schwier et al., 2004). IDs advocate for quality teaching, contribute to faculty growth and development (Schwier et al., 2007; Schwier & Wilson, 2010), and "their ability to perform as architects and leaders of change is an unsung essential function" (Anderson et al., 2019, p. 510) that perhaps even the IDs themselves do not always recognize (Schwier et al., 2004) and may encounter as expectations in their roles in higher education (Chongwony et al., 2020).

Challenges Faced By Instructional Designers

In a study of 174 IDs who reported having formal education in their field, only 51% felt it prepared them for 'most' aspects of their work in higher education (Bond & Dirkin, 2020). Traditional competency models for instructional design, such as the International Board of Standards for Training, Performance and Instruction (ibstpi) may not provide sufficient frameworks for the professionals who seek to work in higher education (Kenny et al., 2005; Mancilla & Frey, 2020; Salentiny, 2012). Park and Luo (2017) go so far in pointing out that higher education is different as to suggest a new model for ibstpi to include foci on conducting research and academic publication, educating/mentoring, and facilitating training; indeed, despite the increasing prevalence of instructional designers in higher education and other industries, the profession may be considered emerging rather than established given the wide variety of functions, backgrounds, and expertise that instructional designers possess and enact (McDonald & Mayes, 2007). The gap between what they have been trained to do and what they must do to be effective is a fundamental challenge faced by IDs in higher education that frames and underlies more specific challenges.

Ambiguous Status

There is confusion and misunderstanding reflected in the ways IDs are formally classified and positioned in higher education. Naming conventions for IDs have only recently begun to normalize and provide clarity to what is becoming a typical position, but even still, institutions may create these positions without fully defining the role they play within the larger organizational structure (Bird, 2004; Richardson et al., 2019; Schwier et al., 2004). Studies consistently reported challenges related to this "ambiguity of status" (Chen & Carliner, 2020, p. 20) and confusion or lack of awareness about ID functions, credibility, and the expertise and value they bring to educational development (Anderson et al., 2009; Campbell et al., 2006; Cowie & Nichols, 2010; Drysdale, 2019; Dykstra, 2020; Hart, 2018; Ren, 2019; Richardson et al., 2018; Ritzhaupt & Kumar, 2015; Salentiny, 2012). Put simply, IDs are often underutilized and/or undervalued in higher education, due in part to their positioning as support staff rather than as valid academic partners (Cowie & Nichols, 2010; Dykstra, 2020; Moskal, 2012; Richardson et al., 2018). This is a challenge for the IDs themselves, as they must be their own advocates and constantly defend their credibility, contributions, and value to the stakeholders with whom they are expected to collaborate and serve (Richardson et al., 2018; Schwier et al., 2004; Schwier & Wilson, 2010).

"Pulling tigers' teeth" (Pan et al., 2003, p. 289)

Challenges within collaborative relationships between IDs and faculty SMEs feature most prominently within the literature and are the most frequently discussed; these challenges of relationship are especially complex because they are both caused by, and sometimes lead to, other kinds of challenges. In a recent literature review focused on course design collaborations, Chen and Carliner (2020) identified a variety of factors that hinder the relationship between faculty and IDs in higher education, specifically, lack of clarity of the ID's role; problems with communication; workload pressures; ownership concerns; and status and power dynamics.

IDs struggle for recognition as credible contributors to educational collaborations with faculty SMEs (Dykstra, 2020). They face challenges due to the understandable discomfort faculty may experience upon realizing they must "open the private culture of teaching and learning" (Schwier et al., 2004, p. 94) to collaborators, especially those collaborators who lack faculty status as IDs do (Richardson et al., 2018). As Chen and Carliner (2020) eloquently stated:

> *[A] power differential exists between instructional designers and faculty, who often lack formal training in education yet, in most organizational contexts, outrank instructional designers in the relationship by virtue of their faculty status (p. 20).*

For many faculty, working in a team or partnership to produce a course or program is new, and may be uncomfortable and accompanied by fear of losing their academic autonomy (Chen & Carliner, 2020; Cowie & Nichols, 2010; Pan & Thompson, 2009; Richardson et al., 2018). Conflicts may arise out of a faculty SME's resistance to recommendations or changes suggested by the ID (Drysdale, 2019; Hart, 2018; Ren, 2019; Richardson et al., 2018). In some cases, faculty may even resist the very innovation that drives IDs' work (Cowie & Nichols, 2010; Miller & Stein, 2016; Richardson et al., 2018), leading the ID to the additional challenge of convincing the SME of the soundness of their suggestions (Dick & Ives, 2009). IDs thus find themselves poised and expected to provide valuable contributions to teaching and learning in the context of resistance and skepticism, playing "a sensitive but tricky role, as pulling tigers' teeth without getting bitten" (Pan et al., 2003, p. 289).

Cultural Challenges

Although they are experienced and knowledgeable about the application of technology to teaching and learning, IDs are typically not experts in the disciplines they support (Bawa & Watson, 2017). This presents a basic challenge to IDs because each collaboration they undertake may be in a discipline that is unfamiliar to them, and that may have pedagogical assumptions of at odds with their own, requiring the ID to adapt to the "prevailing culture of the discipline" (Schwier & Wilson, 2010, p. 144) in order to work effectively among a variety pedagogical belief systems. The values and motivations of faculty SMEs or the employing institution (e.g. financial costs or time constraints) may also pose challenges for IDs in higher education if those motivations appear to be misaligned with their own perceived

social/moral/ethical responsibilities and commitments to the development of quality learning experiences (Campbell et al., 2005; Schwier et al., 2007).

Operational Challenges

Technology and its campus-wide implementation is an expensive undertaking and resources can be limited as higher education institutions continue to shift towards a blended or online model of technology-enhanced education (Sims & Koszalka, 2008). IDs may advocate for technologies to best meet educational goals, but informed decisions may not always be made regarding which technologies to adopt and why (Cowie & Nichols, 2010; Dykstra, 2020). Despite their roles as experts and critical stakeholders when it comes to teaching with technology, IDs often have no voice in the decision-making that directly affects them (Brito, 2017; McDonald & Mayes, 2007; Moskal, 2012), and may be expected to advocate for initiatives that did not achieve widespread buy-in (McDonald & Mayes, 2007). Beyond this, IDs are often misunderstood to be "techies" (Ritzhaupt & Kumar, 2015, p. 65; Schwier & Wilson, 2010, p. 141) who can be replaced by technology implementations, who are underutilized for course development, or whose responsibilities can be absorbed by non-instructional design staff (Fyle et al., 2012; Ren, 2019).

Time presents an additional challenge that IDs and faculty SMEs alike struggle with. Faculty SMEs and IDs' perspectives regarding how much time is required to develop a course or program may be out of sync (Cowie & Nichols, 2010; Dykstra, 2020). McDonald and Mayes (2007) point out that "balancing the need to progress the design process efficiently, against structured opportunities to explore and clarify ideas, is a constant challenge for IDs working with time-poor SMEs" (p. 187). The reality that faculty SMEs do not have time or cannot commit fully to the instructional design project is a common challenge (Richardson et al., 2019; Ren 2019). The ID must make demands of faculty—offering training, providing design frameworks, requesting content, input, feedback, and collaboration—yet lacks any leverage to incentivize or otherwise encourage SME commitment (Miller & Stein, 2016; Richardson et al., 2019; Schwier & Wilson, 2010). Without institutional intervention in the form of faculty incentives or support, this is an inevitable challenge for IDs which can lead to an inability to complete projects (McDonald & Mayes, 2007). While not an overarching theme within the literature, IDs' own workloads and deadlines were also noted as a challenge (Pan & Thompson, 2009). Time or other resource limitations coupled with faculty misunderstanding regarding what IDs do can lead to IDs feeling pressured to skip important steps (such as needs assessments) in order to complete projects quickly (Dykstra, 2020; Hoard et al., 2009).

Support for Instructional Designers

Within the twenty years of literature reviewed in this study, there was no data that might clearly or directly answer the question, "What supports IDs working in higher education?" This section includes allusions to structures and ID characteristics noted in the literature that can be construed as supportive of their work in higher education

Supporting Each Other

IDs in higher education struggle for identity, credibility, and agency, and yet as a professional culture, they seem to know exactly who they are (Ashbaugh, 2011; Campbell et al., 2006; Dykstra, 2020; Obexer & Giardina, 2016; Ritzhaupt & Kumar, 2015; Schwier et al., 2004). As reflective practitioners engaging in a socially-constructed, conversational practice, IDs ask questions about the nature of their work and the effects it has on others (Campbell et al., 2005; Kenny et al., 2005), and they seek collaboration. IDs create and utilize Communities of Practice (CoP) among themselves as well as with, and for, faculty, seeking and providing support alongside their peers, colleagues, and collaborators (Dykstra, 2020; Keppell, 2004; McDonald & Mayes, 2007; Schwier et al., 2004; Schwier et al., 2007). In this way, they generate their own support for the varieties of challenges they face. Other forms of professional engagement that provide support are open resources online, professional organizations, and academic literature (Ritzhaupt et al., 2020; Schwier et al., 2004; Schwier et al., 2007).

Self-representation

Because IDs' roles and functions are often misunderstood, they must assume the responsibility of advocating for themselves (Morgan, 2019; Schwier & Wilson, 2010). In facing and addressing this challenge, IDs are their own

supports, in 'marketing' (Schwier & Wilson, 2010) instructional design and serving the profession (and in turn, themselves) by increasing awareness of the value and expertise they bring to the table. "Designers know that they have a great deal to contribute, and that they make a significant difference in the quality of instruction they influence" (Schwier et al., 2007, p. 31); they seem to generate support for their work and their roles through self-advocacy.

Characteristics and Do-It-Yourself Approach

The literature indicated that IDs often find their roles through non-traditional pathways, presumably because they are inherently well-suited to managing the variety of responsibilities involved in instructional design in higher education. IDs have been described as being adaptable, flexible, and "chameleon" (Bawa & Watson, 2017, p. 2334) in nature (Kirschner, 2002; Moskal, 2012; Ritzhaupt & Kumar, 2015; Shaw, 2012). This adaptability itself may be an endemic form of support; when faced with a challenge or presented with the needs of faculty or learners, IDs seem able to activate the skills best suited to the particular issue at hand. Additionally, problem-solving and the readiness and willingness to constantly learn new skills and evolve with changing contexts (Ritzhaupt & Kumar, 2015; Schwier et al., 2004) are skills that may function simultaneously as unrecognized forms of self-support. IDs expressed a love of learning and a tendency to play to their skills (Dykstra, 2020; Hoard et al., 2019), which can serve to reduce the magnitude and stress of a challenge whether they address it through means that are familiar to them or opt to learn something new.

Feedback

IDs make valuable, high-quality contributions to higher education (Anderson et al., 2019; Ashbaugh, 2013; Brigance, 2011; Campbell et al., 2006; Fyle et al., 2012; McGriff, 2001; Schwier et al., 2007; Vovides & Lemus, 2019). Positive feedback and outcomes, as well as recognition, for their contributions may be another form of indirect support (Dykstra, 2020).

Discussion and Implications

Over the past twenty years (2000-2020), research on IDs in higher education has steadily increased. Researchers have explored the roles and responsibilities IDs fulfill at institutions of higher education, the competencies they need to succeed, the relationships between faculty SMEs and IDs, and the challenges they face. Nevertheless, a significant missing piece in the literature is the existing support (or lack thereof) for IDs that could help them succeed. The focus of this section is thus on possible ways in which IDs can be supported to overcome the challenges outlined in the literature (Table 3).

In addition to their established roles in curriculum design, development and delivery, and faculty support, IDs are beginning to be recognized for the deeper, more expansive, and more transformative potential they offer to institutions: the potential to support strategic missions and bring change at the organizational level (Campbell et al., 2006; Dykstra, 2020; Schwier et al., 2004; Vovides & Lemus, 2019). To alleviate confusion about ID roles and functions and to empower them as credible stakeholders with voices in decision-making (Anderson et al., 2019), IDs should be involved in conversations about redefinitions, revisions, and expansions of their roles in higher education.

Many challenges faced by IDs are created or exacerbated by the positioning of IDs within the institutional hierarchy, while others arise from the nuances of navigating and managing collaborative relationship dynamics. Often due to these intertwined relationships, the challenges experienced by faculty attempting to develop technology-enhanced learning translate directly into the challenges faced by IDs. Institutional support for faculty (e.g. release time or financial incentives for instructional development, faculty development) and scaffolded structures for collaboration and teamwork could help to indirectly lesson or resolve ID challenges. Cowie and Nichols (2010) suggested, "tensions between faculty and instructional design staff can be resolved through a deliberate emphasis on the growing of a new shared culture through careful project management" (p. 89). Important aspects of faculty and ID relationships that could benefit from scaffolds and structure include defining the teamwork process and member roles in advance, establishing the role of technology within the collaboration, building trust through open communication (including about beliefs and pedagogical approaches), and setting clear deadlines and time management expectations.

Table 3

Possibilities for Supporting Instructional Designers in Higher Education

Challenges	Possible Supports
Identity and credibility (misperception of roles, underutilization, undervaluation)	Include IDs in the reconfiguration of their roles. Generate communication campaigns for awareness about ID roles. Recognize IDs publicly for their contributions. Involve faculty and IDs in mixed Communities of Practice (CoPs). Provide IDs with opportunities to conduct research.
Disconnect between role and educational preparation (hidden or undefined responsibilities, missing competencies)	Update ID degree programs based on current research and practice (consider apprenticeships). Seek ID input on job postings and position descriptions. Provide support for CoPs and professional organization membership.
Faculty Concerns (losing autonomy, resistance to innovation)	Engage in change management processes. Communicate with faculty about ID roles.
Resources (workload, faculty workload, time)	Provide faculty with incentives or release time when working with IDs. Utilize project management and structured collaborations.
Power Dynamics (position/status ambiguity, exclusion from academic culture)	Position IDs as members of the academic community. Recognize IDs publicly for their contributions to teaching and learning. Provide IDs opportunities to conduct academic research. Encourage and support ID expansion into leadership roles.

The literature indicates that issues of power and agency remain unresolved for IDs even after decades of their presence on higher education campuses. There are greater numbers of IDs and increased awareness of what IDs do, but the misconceptions, underutilization, struggles in relationships, and lack of status or influence in an institution persist according to the literature. Interviews with IDs described scenarios in which a strategic plan for online learning at their institutions supported their validity and credibility (Dykstra, 2020). Yet changing the status quo of an institutional culture is a significant undertaking and cannot be achieved without buy-in from all stakeholders (e.g., administrators, faculty) and the inclusion of IDs in decision-making.

Limitations

The limitations and delimitations of this review include the search terms, the databases searched, the exclusive inclusion of English terms and literature, and the timeframe for the inclusion of literature (2000-2020). In addition to search parameters and characteristics, the literature review process was guided by specific research questions focused exclusively on IDs working in higher education. This excludes literature on IDs in other contexts who may or may not share similar roles, challenges, and supports.

Conclusion and Future Directions

The field of instructional design in higher education is both mature, having originated over fifty years ago (Reiser, 2001), and emergent, undergoing constant adaptation as technologies and the landscape of higher education evolve. This review sought to understand what has been learned from and about IDs in higher education over the past twenty years. The roles and responsibilities of IDs are well-described, as are their experiences working with faculty, and their challenges in higher education. Despite this depth of knowledge regarding the what and how of instructional design, the literature continues to overlook "important and emerging questions"—the why—for IDs: questions of personal and professional identity, cultural participation, and what it means to be an ID in higher education (Kenny et al., 2005, n.p.). It is important to emphasize that research on the supports utilized by IDs was found to be lacking, as well.

Still more questions remain unexplored. Chen and Carliner (2020) criticized that the faculty perspective is not captured in most research on instructional design in higher education: how do faculty feel about working with IDs - before and also after these collaborations? What do faculty think about the positioning of IDs and their role in higher education? What suggestions do practicing IDs have relative to the modification of their field's professional or educational competencies?

The landscape of higher education teaching and learning continues to change, not only as a result of innovations in technologies for teaching and learning, but also due to the need to respond to global events such as COVID-19 which may alter the operational standards and expectations of colleges and universities for the foreseeable, long-term, future. IDs are unavoidably impacted by changes of this nature and are called upon to use their flexibility and expertise to help institutions and faculty adapt to new ways of educating students. As IDs become increasingly essential to the fabric of higher education institutions, there is an imminent need for research on the emerging challenges they face and the kinds of support they need to be successful.

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How Instructional Designers Approach Conflict with Faculty

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Using a multiple case study approach, we interviewed 14 instructional designers working at different universities to explore the approaches and strategies they utilized when experiencing conflict with faculty. While past practitioner-based research has identified strategies instructional designers employ to cultivate effective and productive collaborations with faculty, there are no similar publications examining how practitioners in the field handle conflict with faculty during these collaborations. Based on an analysis of the interview data, we uncovered conflict prevention and management strategies used by instructional designers that synchronizes with three phases of a typical faculty collaboration timelines: (1) at the outset of the collaboration (2) during the collaboration; and (3) post collaboration. Results suggest an interconnectedness across the approaches and strategies. This article concludes with a discussion of our findings including future research and implications.

Introduction

As internal and external demands for quality online offerings continue to rise in higher education, universities and colleges are prompted to incentivize faculty to transform their on-campus teachings to the online environment (Allen & Seaman, 2017). For many higher education institutions, the COVID-19 pandemic has only accelerated the need to increase their online course offerings (Educause, 2020). Shifting from synchronous to asynchronous teaching is documented as quite challenging for faculty to achieve independently (Kampov-Polevoi, 2010; Kebritch, et al., 2017). In response, universities often partner faculty with instructional designers, who use their combined pedagogical and technological knowledge to help guide faculty through the transition to online teaching (Chao, et al., 2010; Rubley, 2016; Bawa &Watson, 2017; Richardson, et al., 2018).

Consequently, the relationships between instructional designers and faculty have garnered the interest of practitioners and researchers alike with a notable increase of studies over the past seven years (Chen & Carliner, 2020). This growing body of literature has provided many useful strategies about how instructional designers and faculty develop effective

and productive relationships to collaborate (Pan, et al., 2003; Campbell, et al., 2007; Pan & Thompson, 2009; Rubley, 2016; Bawa &Watson, 2017; Richardson, et al., 2018). Surfacing from these studies are indications of tension and, on some occasions, episodes of conflict between instructional designers and faculty (Bawa & Watson, 2017; Castro-Figueroa, 2009; Halupa, 2019; Richardson, et al., 2018; Rubley, 2016). For instance, in a survey of instructional designers and faculty, Rubley (2016) found tensions between the instructional designers and faculty to be centered on differences over "who is the pedagogical expert", "perceptions of the value of technology" and each other's role within the relationship (p. 24-25). While these differences begin to uncover potential causes of conflict, what remains largely unexamined is how instructional designers approach conflict when it arises with faculty. This study seeks to fill this gap.

Collaboration & Conflict

Professional collaborations have the potential to produce multiple benefits within the workplace (Lawson, 2004) and, as a result, are becoming increasingly commonplace across most professions (De Dreu & Weingart, 2003). Collaborating with others has been a routine function of the instructional design profession from the beginning (Keppell, 2001; Reiser, 2001). In their review of the literature on the working relationship between instructional designers and faculty, Chen & Carliner (2020) found these relationships commonly characterized as a collaboration despite a lack of clarity on the specific elements of what makes the relationship collaborative. One exception is that collaborations are commonly conceptualized to only exist when there is shared interdependence between two stakeholders (D'Amour, et al., 2005; Lawson, 2004; Levin, 2012). In other words, two or more stakeholders will find themselves in a collaboration when each party is unable to achieve an identified goal or task independently. The interdependent relationship between instructional designers and faculty has been linked to a shared goal of creating high quality learning for students with the end product ranging from the digitization of a particular component of a course to an entire course being moved online (Pan, et al., 2003; Morrison, et al., 2004; Richardson, et al., 2018).

While interdependence is a critical component of collaborations, it is also found to be a common element associated with conflict (Donohue, 1992; Hocker & Wilmot, 2017; Northouse & Northouse, 1998; Wall & Callister, 1995). Professionals may desire conflict-free collaborations, but conflict management scholars argue this is not a realistic expectation since conflict is considered a ubiquitous human experience (Donohue, 1992; Hocker & Wilmot, 2017; Rahim, 2010; Tjosvold, 2008). Furthermore, Tjosvold (2008) states "conflict can be highly constructive, indeed, essential to teamwork and organizational effectiveness" (p. 19). De Dreu & Weingart (2003) propose, without some conflict, collaborators "might not realize that inefficiencies exist" in their efforts (p. 741). Experiencing opposition from subject-matter experts (SMEs), including faculty, is not a new phenomenon for instructional designers (Wedman, 1989; Keppell, 2001). In fact, Wedman (1989) cites faculty's "resistance" to the instructional design process even prior to the advent of educational technology in higher education. Although each university system can differ organizationally, faculty and instructional designers' shared goal of content transformation is what van de Vliert & De Dreu (1994) identify as "positive goal interdependence". van de Vliert & De Dreu (1994) find these types of conflicts are more likely to be able to be managed constructively. Donohue (1992) adds that constructive conflict tends to "bolster interdependence" between parties (p. 8). Thus, if approached productively, conflict between instructional designers and faculty has the potential to be constructive and yield stronger interdependence between the two parties.

Instructional design skills: Signposts for approaching conflict with faculty

The necessity to develop a versatile skill set is already familiar to instructional designers and these professional skills are consistently reviewed and updated through both research and practice (e.g., IBSTPI, 2012; Sugar, 2014; Wakefield, 2012). Examining the existing literature reveals a wide-range of skills that provide a starting point for instructional designers and how they approach conflict. Based on the review, three specific instructional design skills that are interconnected with conflict management strategies emerged and these are explored next (Donohue, 1992; Rahim, 2010; Wall & Callister, 1995).

Interpersonal Skills

Instructional designers continuously report that possessing strong *interpersonal communication* skills are amongst the most essential skills for effective work with faculty (Bawa & Watson, 2017; Campbell, et al., 2007; IBSTPI, 2012; Keppell, 2001; Kenny et al., 2005; Ritzhaupt & Kumar, 2015; van Leusen, et al., 2016; Wakefield et al., 2012). Interpersonal communication skills encompass a wide range of skills and a number of these skills appear in the literature. In a study of the interpersonal communication skills utilized by experienced instructional designers with faculty, van Leusen et al (2016) identify eight distinct types of skills: "active listening, paraphrasing, summarizing, open questioning, closed questioning, addressing faculty's questions, and informal conversation" with "open questioning" and "informal conversation" being the most frequently observed (p. 255). In a separate study, the overwhelming majority of instructional designers interviewed by Ritzhaupt & Kumar (2015) identified interpersonal communication skills as "far more important than technical skills, because technologies can be learned on the job" (p. 59). The International Board of Standards for Training, Performance and Instruction (IBSTPI, 2012), an organization that guides instructional design professional standards, identify several skills associated with interpersonal communication: write and edit messages that are clear, concise, and grammatically correct; deliver presentations that effectively engage audiences and communicate clear messages; use active learning skills, solicit, accept and provide constructive feedback; present written and oral messages that take into account the type of information being delivered and the diverse backgrounds roles, and varied responsibilities of the audience; and use effective questioning techniques (p. 3-7).

Adaptability

Instructional designers' *adaptability* is also recognized as an important skill and is exemplified through the use of various design models, keeping current with new instructional technologies and modifying pedagogical strategies for different learning situations (Bawa & Watson, 2017; IBSTPI, 2012; Keppell, 2001; Morrison & Anglin, 2009; Rubley, 2016). Researchers also find adaptability to be an essential skill for instructional designers to utilize as they communicate and build relationships with others (Bawa & Watson, 2017; Fortney, 2013; Halupa, 2019; Richardson, et al., 2018; Ritzhaupt & Kumar, 2015). In terms of communicating, instructional designers need to be able to tailor their messages to diverse audiences (Ritzhaupt & Kumar, 2015). Richardson et al. (2018) find instructional designers identify "adaptability through open mindedness and flexibility" as one crucial component to establishing productive relationships with faculty (p.17). When collaborating with faculty, Halupa (2019) describes the importance that instructional designers can adapt:

> *Instructional designers must adjust and adapt to the various levels of expertise and experience. If a designer treats a novice faculty member as an experienced one, there are likely to be issues. Consequently, if a designer treats an experienced faculty member as if he/she does not know anything about online course development, this can cause resentment (p. 63).*

Bawa & Watson (2017) encapsulates the skill of adaptability for instructional designers in their findings which used the acronym and metaphor, "Chameleon" (i.e., Communication, Humility, Adaptability, Mentorship, Engagement, Looping, Empathy, Oscillating, Networking).

Problem Solving

In an instructional design professional setting, *problem solving* tends to refer to instructional designers' ability to help solve instructional problems within the instructional design process (Ertmer et al., 2008; Jonassen, 2004; Morrison, et al., 2004) and is commonly cited as a key competency for instructional designers (Fortney & Yamagata-Lynch, 2013; Kenny et al., 2005; Wakefield et al., 2012). However, in some instances, problem-solving seems to describe instructional designers' conflict resolution. For example, Wakefield et al., (2012) describe the instructional designers' role as "planner and problem solver" to mean resolving both "client concerns quickly" and "strategic conflicts in the design and development of curriculum suggesting win-win conflict resolutions" (p. 3130). More direct references to conflict resolution appear in the literature. In Campbell et al (2007) study, instructional designers specify "explicit conflict resolution" as a skill set needed when working with faculty in higher education (p. 26). The IBSTPI (2012) also finds "effective negotiation and conflict resolution" as advanced level communication skills instructional designers need to

possess. Northouse and Northouse (1998) state, “if conflict is managed in effective and productive ways, the result is a reduction of stress, an increase in creative problem solving. . .” (p. 225).

Collectively, possessing strong interpersonal communication, adaptability and problem-solving provides instructional designers a useful foundational base for use in approaching conflict. As a result, instructional designers may find themselves in a better starting position to approach conflict than professionals in other settings. Learning more about how instructional designers approach conflict with faculty is important for two of reasons. First, the working relationship between instructional designers and faculty is crucial to the overall quality and success of the courses they collaboratively design and develop, which ultimately impacts student learning (Bawa & Watson, 2017; Chao et al., 2010; Halupa, 2019). Therefore, increasing our understanding of how instructional designers approach conflict with faculty can further inform us of the impact conflict is having on this relationship. Second, workplace conflict is highly contextual and multifaceted even within a small work environment (Donohue, 1992; Lederach, 2003; Tjosvold, 2006). Gaining insight into how instructional designers approach conflict with faculty in various higher education settings will open new scholarly conversation and provide a platform for potential professional growth for instructional designers. Thus, the central research question of this study is: How do instructional designers approach conflict with faculty?

Methods

Research Design

To address the research question, this study utilized a multiple-case study design to identify strategies instructional designers find effective in managing conflict with faculty within collaborations (Yin, 2014). Using multiple cases provided researchers opportunity to examine how each individual managed conflict with faculty within their specific context and, simultaneously, garner a variety of instructional designers’ perspectives (Baxter & Jack, 2008). Multiple-case analysis also allowed us to gain a more comprehensive and reliable set of common conflict management strategies used by instructional designers across cases (Yin, 2014). This can be helpful in developing a more thorough understanding of how instructional designers manage conflict with faculty.

Participants & Context

Participants for this study were recruited through the Association for Education Communities and Technologies (AECT) research email initiative and the researcher’s university professional network of instructional designers during the 2020 spring semester. A recruitment email was sent asking potential participants to complete a short, pre-interview survey to provide some basic background information and their experiences of conflict with faculty during collaborations. Using a purposeful sampling method (Patton, 2015), instructional designers were recruited for the study only if they reported routine collaboration with faculty in higher education and had experienced some type of conflict during their interactions with faculty. A total of 46 instructional designers responded to the survey and, of those, 20 instructional designers met the aforementioned criteria and were invited to participate in the study. In the end, 14 instructional designers agreed to participate in the study and all were given a ten dollar Amazon gift card after completion of the interview. Participants’ identities were anonymized with pseudonyms and gender, ethnicity, education, and professional experience are provided in Table 1. Additionally, on the pre-interview survey we asked each participant their confidence level in managing conflict with faculty. All participants communicated they possessed a moderate to high level of confidence in managing conflict with faculty.

Table 1

Participants’ Information

Participant	Gender/Ethnicity		Education	Experience	Confidence Level in Managing Conflict
Allison	Female	Caucasian	Master’s	8 years +	Moderate
Christie	Female	Caucasian	PhD	8 years +	High

Participant	Gender/Ethnicity		Education	Experience	Confidence Level in Managing Conflict
Donna	Female	Caucasian	PhD	8 years +	High
Ellisa	Female	Caucasian	Master's	5-7 years	Moderate
Frank	Male	Caucasian	Master's	5-7 years	High
Hanna	Female	Caucasian	Master's	2-4 years	High
Issac	Male	Caucasian	PhD	8 years +	High
Kenny	Male	Caucasian	Master's	5-7 years	High
Lily	Female	Caucasian	None	5-7 years	High
Michael	Male	Caucasian	PhD	5-7 years	High
Nina	Female	African American	Master's	8 years +	Moderate
Oscar	Male	Caucasian	Master's	8 years +	Moderate
Pamela	Female	Caucasian	PhD	2-4 years	Moderate
Sadie	Female	Asian American	PhD	8 years +	Moderate

Data Collection

For this study, three types of data were collected: (1) pre-interview surveys; (2) semi-structured interviews; and (3) researchers' reflective memos from both the interviews and interview transcripts. Prior to the data collection process, the researcher requested two instructional designers, who have professional experience working with faculty in higher education, pilot the pre-interview survey and semi-structured interview questions (Creswell & Creswell, 2018). After receiving the instructional designers' feedback, edits were made to improve the clarity of the questions. Pre-interview surveys allowed for both purposive sampling at the participant level and to establish rapport with participants before the interview (Creswell, 2015). Using the online surveying tool Qualtrics, pre-interview surveys were sent to collect demographic data, professional experience, educational background, and instructional designers' conflict experiences with faculty including their confidence levels in managing conflict with faculty. When selecting participants, maximum variation strategy was utilized to ensure we captured a diverse set of perspectives of instructional designers with different backgrounds and experiences with conflict (Creswell, 2015). For example, some participants shared more persistent conflict experiences with faculty than others.

In an effort to provide space for participants to share their experiences and conflict management strategies, individual interviews were conducted using semi-structured, open ended questions (Galletta, 2013). To further establish rapport with each instructional designer, the interviewer attempted to develop familiarity and rapport with each participant by asking questions about their day-to-day duties as an instructional designer including typical projects they collaborate on with faculty (see Appendix A). Each interview was recorded, transcribed and uploaded to NVivo for analysis. To help conceptualize the data, the interviewer composed analytical reflective memos after each interview was recorded and during the analysis of the interview transcripts (Strauss & Corbin, 1998). Following Shenton's (2004) recommendation, recurrent collaborative "debriefing sessions" were held between members of the research team to review data collection, discuss reflective memos and preliminary analysis of each case (p. 67).

Data Analysis

As each individual case was documented, a detailed descriptive report was developed for each case including the themes within the case and developing patterns across cases (Creswell, 2015). Each report consisted of participants' responses to the pre-interview surveys, interview transcripts, the researchers' reflective memos from the interview, and analytical feedback through debriefing sessions with research team. Constant comparative analysis was used to identify the themes across cases related to instructional designers' use of conflict approaches with faculty (Yin, 2014). Initially, one researcher open-coded interview transcripts utilizing descriptive coding techniques (Saldaña, 2015). Upon generating the first set of descriptive codes, the codes were reviewed and analyzed by members of the research team and agreement was reached regarding the direction of future data analysis. Focused coding was used and around 15

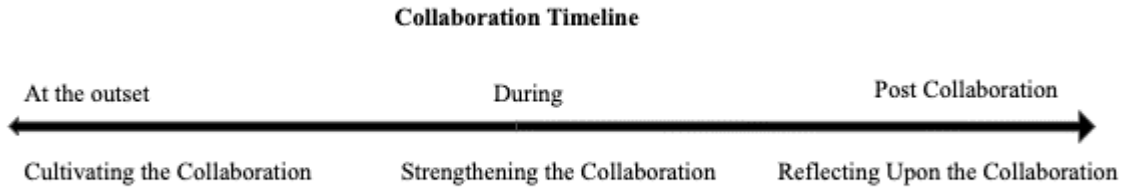
categories emerged across the data (Saldaña, 2015). After five cycles of coding and condensing of codes (Creswell, 2015), we identified a set of conflict prevention and management strategies (e.g., actively listening, fostering a personal relationship with faculty, etc.) spanning across three phases of the collaboration between instructional designers and faculty (see Appendix B). In order to ensure trustworthiness of the data, member checking was used with all participants.

Results

From the interview data, the analysis uncovered conflict prevention and management strategies coinciding with three phases of a typical faculty collaboration timeline experienced by instructional designers (1) at the outset of the collaboration; (2) during the collaboration; and (3) post collaboration (see Figure 1). Surfacing from the interview data and case reports were conflict preventative strategies that the instructional designers utilized at the outset of collaborations to avoid conflict and cultivate a sense of togetherness with faculty. The researchers refer to this strategic phase as *cultivating the collaboration*. Another set of strategies emerged that instructional designers used to *strengthen the collaboration* with faculty during their collaborations. While instructional designers identified distinct strategies for cultivating and strengthening collaborations with faculty, findings suggest the strategies the instructional design participants used were interconnected across the building of relationships with faculty, communications with faculty and various elements of the design processes. Finally, instructional designers also shared reflective strategies focused on professional and personal growth that help them improve conflict prevention and management skills leading into future collaborations with faculty.

Figure 1

Collaboration Timeline



Picture showing phases instructional designers experience while collaborating with faculty

Cultivating the Collaboration

Relationship Building

In recounting collaborative experiences with faculty, instructional designers revealed they commonly enter working relationships with faculty having neither personally met nor worked with the faculty members before. While half of participants (n=7) expressed their preference to begin each collaboration with an in-person meeting with faculty, a subset of these instructional designers viewed *fostering a personal relationship* with each faculty member as a strategy they use to prevent conflict from occurring. Pamela described the goal of establishing a relationship with faculty is accomplished by getting them to see her “as a person rather than an instructional designer”. Christie expanded upon this idea by describing how she attempts to meet faculty in an informal setting (e.g., “for a coffee”), which allows them to get to know each other and helps her establish a more “equitable exchange in the relationship”. She added, if any conflict were to arise between her and the faculty, it is less likely that it will turn into “destructive conflict”. Therefore, prior to entering into the working relationship with faculty, these instructional designers find that developing a personal bond with faculty in a non-work environment is an effective conflict prevention strategy.

Communication

Participants identified two proactive approaches centered on building strong communication foundations with faculty used to both prevent and create space to resolve conflict within collaborations. Six of the instructional designers indicated they approach each new faculty interaction with a sense of *empathy* and are prepared to *actively listen* to the faculty member. For example, Christie pointed out by agreeing to transition their class(es) online, faculty are taking on many risks such as "criticism from their colleagues" and potential "bad student evaluations". Consequently, Christie explained she always enters into faculty collaborations with an empathetic attitude towards faculty members. Donna disclosed she starts each faculty collaboration with a mindset that any "faculty resistance" is typically coming from a positive place as faculty only want what is "best for their students". Therefore, showing empathy and respect for "the naysayers", as Donna described, is a way for instructional designers to avert what they may perceive as initial conflict coming from faculty. Analogous with their expressions of empathy toward faculty were instructional designers use of active listening techniques especially during their first meeting with faculty. Both Kenny and Michael found listening to faculty helpful in gaining an understanding of any thoughts or concerns the faculty member may have heading into the collaboration. For Issac, being an effective listener also meant "to value their [the faculty] experiences and preconceptions". Kenny encouraged "repeating what they're saying so that they understand that you are comprehending" because, in his experiences, it illustrates to faculty they are being heard and understood.

Exhibiting *interest* and *curiosity* towards the faculty's teaching experiences and course content was another strategy instructional designers identified to build stronger connections with faculty. For example, Pamela described how she "familiarizes" herself with each faculty member's course content and writes down a few questions to ask during the first meeting. Then, in the initial meeting with faculty, Pamela expressed she is able to better demonstrate an authentic interest in the faculty member's subject matter and teaching methods. In addition, Christie explained how she attempts to get the faculty member discussing "what goes really well for them when they're teaching" the particular subject or course. From her experiences, she is able to tease out what excites faculty about teaching and can create a shared positive connection as they begin the collaboration.

The final strategy focused on communication shared by instructional designers was how they begin each project by *developing a customized communication plan* with each faculty member. Participants recommended learning the faculty member's preferred means of communication (e.g., in-person, email, text message, etc.) and creating an agreed upon plan of communication. Ellisa and Christie suggested obtaining the agreed-upon communication plan in writing, which they find reduces the chance of miscommunication with the faculty member. Frank added he builds flexibility into any communication plan with faculty to allow space for adjustment if the original plan does not work. Hanna summarized this process well:

> *Be in close contact with your faculty members and use your best judgment to figure out the best way that you can communicate with them. Sometimes instructors will prefer phone calls over emails. Sometimes they will only do email. Work with them to develop the best kind of communication style.*

Design Process

Emerging from the interview data were conflict preventative strategies instructional designers use in the beginning phase of the design process. One of the more widely used strategies identified by instructional designers (n=8) was their attempt to *create collaborative goals and incentives* with the faculty. Ellisa described one of her approaches to creating collaborative goals with faculty is to "always have an initial meeting, face-to-face, where we communicate about the goal, what my goal is, what their goal is and make sure we're on the same page in terms of our vision[. . .]" Embedded within this strategy were ways in which instructional designers try to incentivize collaborations. For instance, Kenny specified trying to "create a win-win situation" (e.g., small project milestone) for both him and faculty early on in the design process. Both Christie and Issac attempt to incentivize the design project by working with faculty on identifying a research study to collaboratively complete during the project. Christie explained "I approach design from a strength-based, you know, point of view. I am always committed to helping them get research out of the project [. . .] my mantra is make everything work twice". Thus, these instructional designers find this strategy to build positive momentum and motivation for both them and the faculty accentuates their collaboration.

Additionally, when entering new collaborations instructional designers recognized that proposing too many course design changes can overwhelm faculty and cause discord. As a result, an approach to *seek incremental change* surfaced from instructional designers interviewed. Allison expressed this notion concisely by stating “if you try to make it a perfect course, you won't get there the first time because they'll hate you”. Allison suggested “do things only incrementally[. . .] introduce one active learning strategy each class or each topic”. Issac echoed this sentiment and added that “change will be slow, so sort of bite-sized improvements” over different iterations of the course. These instructional designers seemed to take a more long-term approach to the course design process and sensed by taking this approach faculty were more willing to come back to them for help in preparing for future iterations of the same course.

Strengthening the Collaboration

Relationship Strengthening

When the collaboration with faculty is underway, instructional designers identified the need to *re-emphasize the interdependent relationship* they share with faculty as a method to maintain balance in the relationship. For example, Lily indicated she routinely must “loop back” to the shared interdependence between her and faculty during the collaboration. Lily conferred that it is helpful to remind faculty they are not alone, but to maintain she “can’t do it all for them”. Michael and Frank conveyed that they often must remind faculty, as instructional designers, they do not possess the faculty member’s subject matter expertise and the member must lead the way in connecting content to student learning experiences. Accordingly, these revelations seem to highlight some of the challenges instructional designers face when transitioning from the personal relationship to the collaborative relationship with faculty.

Communication

Instructional designers offered various communication strategies to manage and mitigate conflict with faculty during collaborations. Participants identified how they attempt to communicate *clearly* and *concisely* with faculty to decrease the probability of conflict. For instance, Pamela described she always tries to make “communication clear and not redundant” and tries to not “overwhelm the faculty [member] with so many details”. Pamela finds this allows her to have more meaningful communication with faculty and reduces the chance of miscommunication. Other instructional designers mentioned being clear and concise in their communications with faculty helped keep the collaborative projects on track. Ellisa delineated “I will send a quick email with a reminder of things that I need with an estimated due date[. . .]that tends to keep instructors back on track but also more generally, just developing rapport.”

Nevertheless, when experiencing a communication breakdown with faculty, half of the participants (n=7) shared experiences of having to routinely *adapt* the agreed upon communication plan with faculty. Considering their experiences, Frank and Lily find taking the lead on compromising and adapting to the faculty member’s communication preferences and schedule helped them alleviate pressure on faculty, thus, reducing the likelihood that conflict would arise.

Another communication strategy cited by instructional designers was more directly related to the actions taken if they sensed a conflictual tone in communication from faculty. In these instances, participants shared they would *seek clarification* from their colleagues. Ellisa described how she employed this strategy:

> *If something comes across via email or communication from faculty that doesn't rub me the right way, I might seek out an external person to read those documents or interpret them. And sometimes, my understanding is, they're like, Oh, no. I think what they meant to say was this. So, sometimes getting an outsider’s point of view, especially with the different personalities that we do run into.*

Hanna’s experiences reflected this strategy of using the resourcefulness of her colleagues by recounting “they’ve been hugely helpful for me whenever I have delays or issues with faculty”. Therefore, participants used collaboration with their colleagues to help guide them in navigating conflict with faculty.

Design Process

When the design process is fully in progress, instructional designers identified two overlapping strategies used to avoid conflict. Building upon the idea of seeking incremental change described earlier, participants expanded on how they *prioritize design choices* as the design process is underway. Pamela best described this strategy through her observations of other instructional designers:

> *The instructional designer has a whole crazy new idea, but it will take a lot of time, then maybe it's not the best way to go . . . also considering these kinds of things, like, how much time will it take for the subject matter expert to do this change, or how much effort can they really give to this new change or new technique design.*

Instructional designers recognized proposing too much change through elaborate design choices can increase cognitive dissonance for faculty and result in tensions within the collaboration.

One of the most often cited conflict management approaches in this study was how instructional designers *demonstrate examples of design proposals* to faculty. Findings revealed a couple different aspects to this approach. First, a couple of instructional designers provide practitioner-based examples from past course designs projects. For instance, Allison recommended developing “a portfolio of good examples” to illustrate each design proposal in action. Oscar described how he used this approach: “I kind of show my work and kind of explain why my recommendation is what it is, and kind of show them how it's all connected”. Second, the remaining instructional designers seemed to connect their design proposals to the existing research literature. Kenny best described this angle:

> *Faculty, to me, at least PhD faculty in higher education, respond well to having those research articles to draw from and use as examples. So the same way that they kind of require their students to critically think and go through that material, you have to approach it as they see you as a student, and you're having to convince them that you know what you're talking about, and that there is supporting information out there to back it up. That seems to get a long way, too.*

Regardless of whether practical examples or research-based examples are used, instructional designers found providing evidence-based design proposals aided in preventing conflict with faculty.

Reflecting Upon Collaborations

Several of the instructional designer participants (N=4) shared a few strategies found to be helpful in becoming better prepared to prevent and manage collaborative conflict with faculty. All these strategies were reflective in nature and utilized post-collaboration. Significantly, all the approaches shared centered around the idea of instructional designers continuously sharpening and adding to their skill-set. For instance, two of our instructional designers described how integrating scholarly inquiry into their collaborations with faculty pushes them to learn to work with various types of people (e.g., faculty and other instructional designers) and learn whether or not the course designs are working from a learning perspective. Sadie described the conflict management skills she gained while working on a publication with a faculty collaborator:

So we worked with a diagram and he was able to visualize a concept map of the things he wanted to visualize. So like, this problem-solving process really motivated me or forced me to gain more skills whenever problems emerged . . . when you're working on these different projects, people and project management and talking with publishers, this can become an implicit side of skill gaining.

Issac explained how he used scholarly inquiry in the past experiences to learn how course design choices and changes impacted student learning. Specifically, for Issac, these “collective studies” are an effective tool for “showing the results” of course design to current and future faculty in collaborations.

Other instructional designers reported the training they received outside the instructional design profession has assisted in being able to better navigate conflict with faculty. Kevin suggested his undergraduate educational

background in communications and continued pursuit of knowledge in this area allowed him to be more “well-rounded” when dealing with conflict. Likewise, Donna added additional training in “change management” provided the ability to analyze where “resistance comes from” when working with faculty.

Discussion

Analysis of the results indicate instructional designers employ a wide range of strategies to navigate conflict with faculty across three main phases of collaborations (i.e., at the outset, during, and post-collaboration). Almost all of the strategies reported by instructional designers centered more on conflict avoidance and less on how to manage instances of conflict when it arises with faculty. Specifically, participants shared how to strategize to prevent conflict with faculty through relationship building approaches, effective communication techniques and actions to take during the design process. When considering these approaches in tandem, they are interconnected and often utilized in conjunction with one another.

Many of the conflict prevention approaches described by our instructional designers were aimed at humanizing themselves in the eyes of the faculty, and concurrently meant to cultivate a sense of togetherness with faculty. When trying to nurture personal relationships and connections with faculty, participants attempted to meet faculty in informal settings with the goal of getting to know each faculty member prior to the launching of formal collaborations. This strategy is consistent with past research findings on how instructional designers’ build collaborative relationships with faculty. For example, Richardson, et al. (2018) reported instructional designers found “getting to know [. . .]” faculty and making “connections with them as people [. . .]” were important in building trust and rapport within their relationships. Similarly, van Leusen, et al., (2016) observed instructional designers collaborating with faculty and found one way they built “trust and connections” with the faculty was through their “informal conversations” (p. 253).

Noticeably, participants shared several strategies seeming to convey to faculty the instructional designer’s personal commitment and attentiveness to the faculty member. For instance, instructional designers reported expressing empathy and using active-listening techniques with faculty. In previous studies, instructional designers have identified empathy as an essential element in building successful collaborative relationships with faculty (Bawa & Watson, 2017) and active listening has been widely cited as a necessary skill for instructional designers (Fortney & Yamagata-Lynch, 2013; Richardson et al., 2018; van Leusen, et al., 2016). When coupled with instructional designers’ efforts to show interest and curiosity toward faculty’s content area and teaching experiences, collectively, these strategies can help portray instructional designers as caring and engaged professionals. Moreover, participants' approaches to incentivize their collaborations with faculty, especially through joint research endeavors, is another way instructional designers try to promote cooperation. Instructional designers’ approaches to humanizing themselves and cultivate togetherness with faculty in collaborations are grounded in the hopes that faculty will reciprocate. Therefore, diminishing the likelihood that conflict will derail the collaboration. Despite all of these efforts, instructional designers still noted routinely have to re-emphasizing their interdependence with faculty at various points in the collaboration which signals these strategies do not always result in success.

Subsequently, the remaining strategies identified by instructional designers were anchored in practicality, best construed by the expression of “getting out of one’s own way”. More specifically, the instructional designers who participated in this study did not want to be the source of conflict, and utilized these strategies to achieve this desired goal. For instance, participants' efforts to avoid miscommunication with faculty through purposeful communications techniques, including getting a communication plan in writing, was the first representation of this idea.

The need for instructional designers to be able to communicate with clients effectively and efficiently is well documented in the literature (Bawa & Watson, 2017; Gibby et al., 2002; Klein & Jun, 2014; van Leusen et al., 2016; Wakefield et al., 2012). Even when instructional designers perceived conflict coming from faculty, they took a cautious approach and consulted their colleagues for advice. This is closely aligned with our findings of instructional designers’ willingness to adapt to faculty needs in order to avert conflict, which also has been found to be an important characteristic for successful collaborations (Bawa & Watson, 2017; Halupa, 2019; Richardson et al., 2018). An

unexpected finding was instructional designers' recognition of typical steps in the design process (i.e., prioritizing design choices and showcasing examples of these suggestions to faculty) as conflict prevention approaches. This seems to indicate they may have experienced instances of conflict with faculty during these particular project phases.

Limitations and Future Research

Obtaining the perspectives and experiences of 14 instructional designer participants, this study unveiled a set of conflict prevention approaches these instructional designers utilize with faculty during collaborations. While we were only able to conduct one interview with each participant, we were able to complete 14 interviews providing a deeper range of experiences and approaches to consider and analyze. As with any research of participants' perceptions and experiences of conflict within their profession, one would anticipate some built-in limitations due to the sensitivity of the topic. For example, there were some instances notated by the interviewer where some of the participants seemed to be disinclined to expand upon the thoughts and experiences they were sharing during the interview.

Our findings seemed to uncover a potentially fertile line of future research. To start, an investigation of faculty's perceptions and experiences of conflict with instructional designers could provide perspectives of the other side of these collaborations. Also, researchers should examine how instructional designers in other workplace settings (e.g., corporate, K-12, etc.) manage conflict in collaborations. Building upon the preventative strategies identified in this study, future studies could concentrate on how instructional designers manage and mitigate conflict with faculty when it arises. While this may require a researcher mirroring an instructional designer through a collaborative project with faculty, it could provide invaluable and deeper insights into the conflict management strategies used by instructional designers.

Implications

Based on the interviews with participants, it is evident instructional designers actually spend quite a bit of time, thought, and energy trying to avoid conflict with faculty. This converges with clues from the literature (Bawa & Watson, 2017; Pan et al., 2003; Rubley, 2016; Tate, 2017), and our analysis that the potential for conflict is embedded within each phase of faculty collaboration for instructional designers. One implication is that conflict may be more pervasive within collaborations between faculty and instructional designers than originally suspected. Fortunately, many of the conflict prevention strategies shared by instructional designers were either directly connected or interconnected to the existing collaborative strategies within the literature (e.g., skills related to interpersonal communication, adaptability and problem solving). This has the potential of providing instructional designers a favorable position to managing conflict with faculty and other collaborators. However, the findings show instructional designers seem to be shouldering or, at least, feel primarily responsible for the conflict management within collaboration with faculty. To help alleviate some of this burden, universities and/or instructional design graduate programs could develop specialized training for instructional designers in conflict management strategies.

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Appendix A: Interview guide

1. In the pre-survey, you identified that you have worked as an instructional designer for (confirmed number of years from pre-interview survey). How many of these years have been in higher education?
2. Could you please describe in more detail your current role and responsibilities as an instructional designer?
3. What type of collaborative projects do you usually work with faculty?
4. From your experience, what are some effective strategies you have or you have seen being used to approach conflict in collaboration with faculty?
5. What advice would you offer to an instructional designer who is new to working with faculty when it comes to effectively managing conflict that may arise?

Appendix B

Collaborative Phases	Conflict Mitigation & Management Strategies

Cultivating the Collaboration	• Relationship Building
	  ◦ Fostering personal relationship
	• Communication
	  ◦ Approaching faculty with sense of empathy
	  ◦ Utilizing active listening techniques
	  ◦ Exhibiting interest and curiosity towards faculty's teaching experiences and course content
	  ◦ Developing customized communication plan
	• Design Process
	  ◦ Create collaborative goals and incentives
	  ◦ Seek incremental change

Strengthening the Collaboration	• Relationship Strengthening
	  ◦ Re-emphasize the interdependent relationship
	• Communication
	  ◦ Communication clearly and concisely with faculty
	  ◦ Adapt the communication plan (if needed)
	  ◦ Seek clarification from colleagues and mentors
	• Design Process
	  ◦ Prioritize design choices
	  ◦ Demonstrate examples of design proposals

Reflecting Upon Collaborations	• Integrating scholarly inquiry into collaborations with faculty • Seek training outside instructional design

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Participants' Perceptions of Burden During the Needs Assessment Process

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Instructional Design | Needs Analysis | Needs Assessment | Consultants

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Needs assessments are avoided due to perceptions of burden associated. While most research focuses on the facilitators, this research leverages the Perceived Burden in Needs Assessment Participant Scale (a= 0.86) to explore the participant perspective. Most participants reported low levels of burden (n = 244, M = 2.97, SD = 0.88), debunking the myth of severe levels of needs assessment burden. The results also yielded implications for NA practice, including that practitioners should: 1) make use of extant data, 2) ensure tasks and recommendations are reasonable, 3) minimize what participants must give up, 4) remain flexible, and 5) seek understanding.

Introduction

Instructional design (ID) is the "science and art of creating detailed specifications for the development, evaluation, and maintenance of situations which facilitate learning and performance," (Richey et al., 2011, p. 3). While the design and implementation of interventions can be most readily envisioned as linked to ID, the field and practice has a great deal of depth. One of the ultimate goals of ID is to achieve learning and other relatively permanent changes in behavior or performance for the better (Mayer, 1982). Needs assessment (NA) is a tool that can help ID practitioners achieve that end; it supports quality decision-making that can lead to improving learning outcomes or performance (Watkins et al., 2012). Unfortunately, NA is not leveraged as much as it could be in many instances. They are sometimes deemed inconvenient or unfeasible due to the constraints of time or the perceived drain on resources (Cervero & Wilson, 2006; Zemke, 1998). In fact, they are often avoided or relabeled with other names (Adams et al., 2021; Watkins et al., 2012) to diminish misconceptions of burden (Pinckney-Lewis, 2021b)

This research seeks to explore these perceptions of the NA process but also to fill a gap in the literature (e.g., Altshuld & Witkin, 2000; Guerra-Lopez, 2018; Kaufman & Guerra-López, 2013; Stefaniak, 2020; Watkins, 2014; Wedman, 2014), which most often explores NA challenges from the practitioner point of view (Bates & Holton, 2002; Zemke, 1998). This

research centers the actual lived experience of NA participants and addresses the dearth of literature focusing on their perceptions of burden. When we look at NA holistically, participants play an essential role in the process by serving as partners or data sources (Watkins et al., 2012). Therefore, it is crucial to examine their perceptions of burden in the process to see if these reported claims of burden are warranted. Examining the complexities of the participant experience within NA will help to inform ID practice and ultimately enhance the participant experience going forward.

Within the researcher's (2021a) mixed-methods study, they explored several aspects of the phenomena of perceived burden in the needs assessment experience. The overall study included 1) the development and validation of a scale to measure NA participants perceived burden in the NA process, 2) the results of NA participant responses to the scale, 3) a comparative case study of NA participant experiences, and 4) a cumulative case study of NA facilitators experiences and perceptions. This article focuses solely on the second portion of the larger study: NA participants experiences and re recommendations resulting from that inquiry. Specifically, this article will address these questions:

1. How do participants in needs assessments rate their perceived burden in the process?
2. Do participant perceptions of burden ratings vary across organizational contexts, constituent types, and/or lengths of affiliation with the organization?
3. Which aspects of the NA process are rated the most and least burdensome for participants?

Literature Review

To understand the participant experience within needs assessment (NA), it is important to understand what needs assessment is. NAs aim to identify gaps between what is and what is desired to be (Watkins & Kavale, 2014). The researcher operationally defines NA as *the data-driven search for opportunities to maximize individual, team, or organizational performance by contributing to the effectiveness, efficiency, and/or ease of supporting organizational goals* (Pinckney-Lewis, 2021b; Pinckney-Lewis & Baaki, 2020b, 2020a). NAs can be leveraged both when there is a suspected problem with performance as well as proactively, to determine the level of success current performance (Kaufman & Watkins, 1999; Pinckney-Lewis & Baaki, 2020b; Watkins et al., 2012). While there are several models of NA ranging in formality and rigor, this research does not limit its focus to any one model, accepts that needs assessment in practice lives across the spectrum of these practices, and seeks to understand the participant experience regardless of the model used.

Defining Perceived Burden

It is important to also define burden as it may surface within NA. While well studied within the medical field (e.g., Disease Burden Morbidity Assessment (Wijers et al., 2017), Perceived Family Burden Scale (Nielsen et al., 2016)), the study of burden is not well established within the NA literature. This research explores four realms within NA where burden may manifest: 1) the duties, obligations, and responsibilities participants are asked to fulfill; 2) the cost (i.e., what they must give up) of participating; 3) how they perceive the technical credibility of the NA facilitator; and 4) how well they perceive the NA facilitator to be able to navigate the organizational system (Pinckney-Lewis, 2021b). When it comes to duties, obligations, and responsibilities, NA participants can be tasked in various ways. They may 1) provide project scoping or oversight (Altschuld & Kumar, 2010; Kaufman & Guerra-López, 2013; Witkin & Altschuld, 1995); 2) supply various extant data sources, serve as the gateways to other data forms (Kaufman, 1977; Kaufman & Guerra-López, 2013; Rossett, 1982); 3) provide data themselves via focus groups, interviews, or surveys (Altschuld & Kumar, 2010; Leigh et al., 2000; Stefaniak, 2020; Watkins et al., 2012); 4) or otherwise remain involved over time. Coming from expectancy-value models, cost is "what an individual has to give up to do a task, as well as the anticipated effort one will need to put into task completion,"(Eccles, 2005, p. 113). The sacrifices participants make affect their experience. Finally, when NA participants interact with facilitators, they need to feel heard while also entrusting the practitioners to be credible and flexible while causing minimal disruption to the organizational social system. To do so, NA facilitators must be able to understand and navigate organizational systems, power, interests, negotiation schemas, and responsibility (Cervero & Wilson, 2006; Pinckney-Lewis, 2021a; Stefaniak, 2020; Wilson & Cervero, 1996).

Defining Needs Assessment Participant Types

To achieve the best practice of triangulation within the NA, collecting data from entities at various organizational levels is essential (Stefaniak, 2020; Witkin & Altschuld, 1995). To that end, it is important to define NA participant types of interest within this research. Generally, participants are those NA constituents that were not liable for the analysis, findings, or results of the effort. For additional clarification, the researcher described NA participants as fulfilling one of three major roles: Clients, Data Providers, and/or Stakeholders. Clients are those that either request the NA or are the primary recipients of NA results. Data Providers are those responding to surveys, participating in interviews or focus groups, and/or providing documentation to contribute to the NA. Finally, stakeholders are any others with a vested interest in the organization and/or the outcomes of the NA. While it is common for participants to identify with more than one constituent type, participants in this research had to have served as at least one (Pinckney-Lewis, 2021b).

Methodology

In order to assess the perceived burden in NA participants, the researcher leveraged the Perceived Burden in Needs Assessment Participants Survey (PBNAPS) (a= 0.86) (Pinckney-Lewis, 2021b). While the rigorous scale development and validation process from the first portion of the mixed-methods study is described in detail in Pinckney-Lewis & Lynch (in process), it is important to note the researcher modified items from Pinckney-Lewis' (2019) scale and Flake, et. al.'s (2015) Expectancy-Value Scale, in addition to crafting new items to cover four components: 1) Perceptions of Duties, Obligations, and Responsibilities (PDOR), 2) Perceptions of Cost (POC), 3) Perceptions of Practitioner Skills (PPS), and 4) Perceptions of Practitioner Organizational Sensitivities (PPOS).

After a subject matter expert beta review and pilot, the researcher applied a 7-point Likert and deployed the scale via Qualtrics™ to reach as many diverse participants as possible (Vito & Higgins, 2015; Watkins & Altschuld, 2014). Through a combination of criterion and maximum variation sampling (Hays & Singh, 2012), participants were required to represent at least one completed NA project as well as be aware they served as at least one of the constituent types. However, the researcher did not restrict organizational types or contexts within which these projects took place. While participation was voluntary, every research participant had the option to enter a lottery for one of five $25 gift cards.

Participants

While 381 self-selected individuals visited the PBNAPS online, the researcher eliminated 137 respondents for either not providing consent or not completing a substantial portion of the actual survey to receive an overall PBNAPS score. Therefore, 244 total participants were included in the overall analyses. As was the goal of the research, participants represented various organizational contexts (see Table 1), organizational affiliation types (see Table 2), and years of affiliation (see Table 3).

Table 1

Summary of PBNAPS Respondents Organizational Context Types

Organizational Type	#Respondents	% Respondents
Government entity (i.e., county, state, or federal level)	111	45
For profit entity	36	12
Non-profit entity	73	15
No response provided	8	3
Other	29	
"Other" Organizational Context References		
Education Sector	29	
Charter Schools	1	

Organizational Type	#Respondents	% Respondents
Higher Education	9	
Private Schools	2	
Public Schools	12	
Medical Sector	4	
Clinic	1	
Doctor's Office	2	
Hospital	1	
Family	1	

Table 2

Summary of PBNAPS Respondents Organizational Affiliation Types

Affiliation Type	#Respondents	% Respondents
Customer or Client	53	21.63
Employee	105	42.86
Executive-level Leader	16	6.53
Manager/Supervisor	39	15.92
Partner	10	4.08
Volunteer	12	4.90
More than One Affiliation Type	7	2.86
Blank	6	2.45
Other[a]	14	5.71

[a]Note: Other affiliations listed by participants include: Parents, Retired Employees, Teachers, Administrators, Students, and having no known affiliation.

Table 3

Summary of PBNAPS Respondents Years of Organizational Affiliation

Affiliation Length	#Respondents	% Respondents
<1 year	27	11.02%
1 – 3 years	55	22.45%
4 – 6 years	55	22.45%
7 – 10 years	48	19.59%
11+ years	53	21.63%

Analysis

To explore how participants rate their perceived burden in the NA process, the researcher leveraged quantitative, descriptive statistics of the survey results, including calculating the overall scores, mean scores, and standard deviations of PBNAPS scores for all respondents and for each of the individual items. To analyze PBNAPS results, the researcher divided the 7-point Likert scale into three segments such that scores falling within the 4.5 or above range were considered high (*n* = 15, 6.1%). They were considered medium if they fell between 3.3 and 4.4 (*n* = 76, 31.1%). Finally, scores were considered low if they were 3.2 or below (*n* = 161, 66.0%) (Pinckney-Lewis, 2021a). To determine

whether these reports varied across organizational context, affiliation type, or length of organizational affiliation, the researcher also compared the means of these groups via one-way analysis of variance.

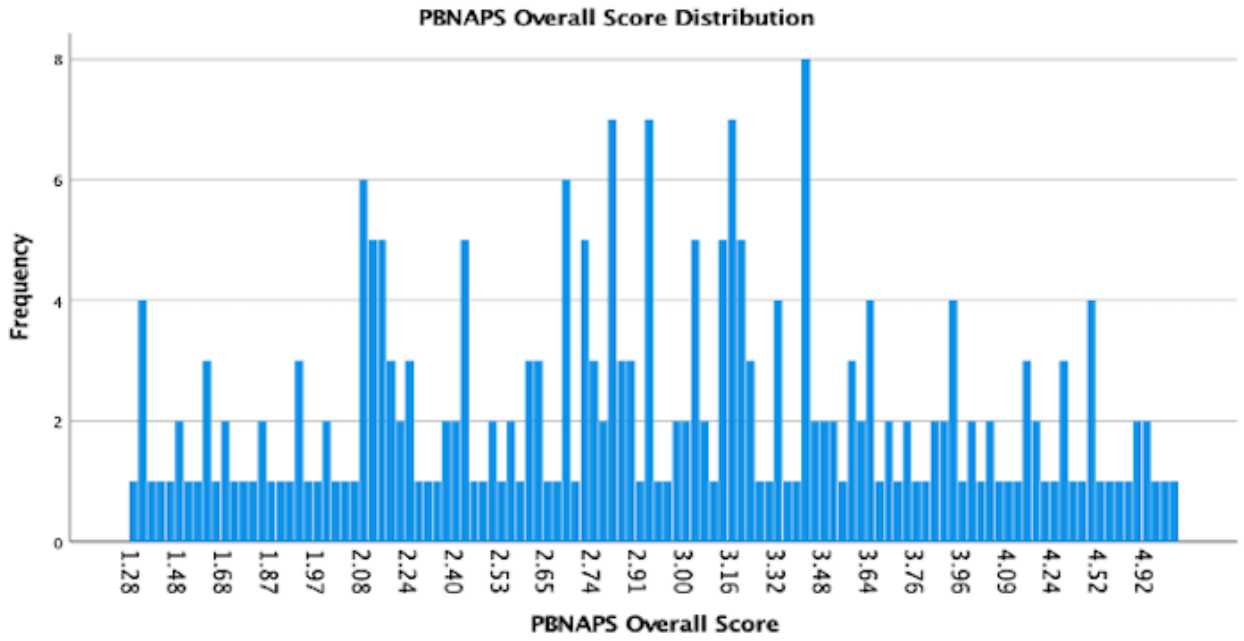
Results

Overall Ratings

Overall, the PBNAPS respondents (n = 244) reported relatively low amounts of perceived burden (M = 2.97, SD = 0.88) based on the 7-point scale (Pinckney-Lewis, 2021b). Their distribution of scores was slightly positively skewed (0.39, SE = 0.16) with a kurtosis of 0.02, suggesting the distribution of scores is slightly peaked in the center (Pallant, 2016). Figure X. summarizes the frequency and distribution of these scores.

Figure 1

Summary of PBNAPS Overall Score Distributions



A picture containing a visual representation of descriptive statistics. The title of the image reads: PBNAPS Overall Score Distribution. The x axis title is PBNAPS Overall Score. The y axis title is frequency. Bars for each score show how many participants reported that overall scores.

PBNAPS Ratings by Organizational Context

When responding to the PBNAPS, participants could select as many organizational context options as applied to their experience. They were also able to fill in “Other” answers to provide additional context. For the purpose of these analyses, the researcher transformed their input accordingly by 1) honoring all written-in responses, 2) recording all instances where respondents selected more than one organizational context as “More than one organizational context,” and 3) recording the one recorded family the organizational context within the “Other unspecified” context. As such, many of the groups described within the PBNAPS Participants section, decreased in this analysis.

The largest number of constituents belonged to the government sector (n = 99), which also had the highest average PBNAPS score (M = 3.15, SD = 0.94). Table 4 summarizes the remaining PBNAPS results by organizational context. When comparing the means of these groups via a one-way analysis of variance, there was no significant difference by organizational context, F (6, 231) = 1.58, p = 0.154 (Pinckney-Lewis, 2021b).

Table 4

Summary of PBNAPS Scores by Organizational Context

Organizational Context	N	Average PBNAPS Score	SD
Government	99	3.15	0.94
Non-Profit	64	2.89	0.91
For-Profit	33	2.84	0.76
Education	25	2.91	0.67
Medical	3	2.59	0.69
More than one context	9	2.61	0.60
Other/Unspecified	5	2.49	0.54

PBNAPS Ratings by Organizational Affiliation Type

When identifying their organization affiliation types, PBNAPS respondents were also able to select as many options as were applicable. They again had the option to select “Other” and provide additional details for context. For these analyses, the researcher transformed these responses by: 1) coding those reporting multiple affiliation types within the organization at the most senior level they selected; 2) recording those that chose “Other” and specified being a paid member of an organization, parent in relation to an educational setting, student in relation to an educational setting, or a member of the public, as a “Client or Customer”; and 3) including the one case selecting multiple affiliation types that could not be slated by the preceding protocol, within the “Other, not specified” group.

The largest number of respondents indicated they were organizational Employees (n = 105) and reported an overall average perceived burden rating of 3.10 (SD = 0.79). Table 5 summarizes the remaining PBNAPS scores by affiliation type. When comparing means of PBNAPS scores by affiliation type, there was no significant difference, $F(6,230) = 1.38$, p = .222 (Pinckney-Lewis, 2021b).

Table 5

Summary of PBNAPS Scores by Affiliation Type

Organizational Context	N	Average PBNAPS Score	SD
Volunteer	9	3.19	1.28
Employees	105	3.10	0.79
Manager/Supervisor	38	2.87	0.97
Executive-level Leader	16	2.58	0.95
Partner	8	2.74	1.50
Client/Customer	57	2.94	0.74
Other, not specified	4	2.56	0.46

PBNAPS Ratings by Length of Affiliation

Finally, the PBNAPS respondents reported the lengths of time for which they were affiliated with the organizations in which they were involved in the NA. For this demographic type, respondents were only allowed to select one time length option. Those respondents that reported less than a year-long affiliation with their organization (n = 27) also reported the lowest average perceived burden (M = 2.61, SD = 0.69). Table 6. summarizes the remaining data. Again for this group of demographics, a one-way analysis of variance showed the effect of length of affiliation on PBNAPS outcomes was not significant, $F(4, 233) = 1.57$, p = .183 (Pinckney-Lewis, 2021b).

Table 6

Summary of PBNAPS Scores by Length of Affiliation

Length of Affiliation	N	Average PBNAPS Score	SD
<1 year	27	2.61	0.69
1 – 3 years	55	3.11	1.07
4 – 6 years	55	2.95	0.86
7 – 10 years	48	2.99	0.83
11+ years	53	3.03	0.76

Perceived Burden by PBNAPS Component

Participant Ratings on Perceived Duties, Obligations, and Responsibilities (PDOR) Subscale Items

Two hundred sixty-three respondents fully completed the PDOR subscale's six items (α = 0.53). Overall, these respondents reported an average PDOR subscale score of 3.67 (*SD* = 1.07). PBNAPS respondents reported the highest average amount of burden in response to item PDOR6: *I should not be tasked with addressing any recommendations from the needs assessment* (*M* = 5.35, *SD* = 1.83). Respondents reported the least amount of reported perceived burden against PDOR3: *The tasks I was asked to complete were reasonable given the scope of my responsibilities within the organization* (*M* = 1.94, *SD* = 1.34). Table 7 provides a summary of average PDOR subscale results.

Table 7

Summary of Average PBNAPS Respondent Scores by PDOR Subscale Item

ID	Item Description	Average Score N = 263	SD
PDOR1	I had few responsibilities within the needs assessment.	4.00	2.10
PDOR2	I volunteered to participate in the needs assessment.	2.78	2.14
PDOR3	The tasks I was asked to complete were reasonable given the scope of my responsibilities within the organization.	1.94	1.34
PDOR4	I had too many responsibilities within the needs assessment.	3.18	1.91
PDOR5	I was obligated by my organization to participate in the needs assessment.	4.73	2.34
PDOR6	I should not be tasked with addressing any recommendations from the needs assessment.	5.35	1.83

Participant Ratings on Perceptions of Cost (POC) Subscale Items

Two hundred sixty-three respondents completed all six POC subscale items (α =0.68). Overall, they reported an average POC subscale score of 2.69 (*SD* = 1.14). The item against which respondents reported the most reported perceived burden was POC1: *I had to give up other commitments to work on this needs assessment* (*M* = 3.11, *SD* = 2.13). The item with the lowest average score, and therefore the least reported perceived burden, was POC6: *The efforts I made to participate in the needs assessment are worth the benefits the organization will gain* (*M* = 2.28, *SD* = 1.65). Table 8 provides a summary of the POC subscale results.

Table 8

Summary of Average PBNAPS Respondent Scores by POC Subscale Item

ID	Item Description	Average Score N = 263	SD
POC1	I had to give up other commitments to work on this needs assessment.	3.11	2.13
POC2	I have so many other commitments that I could not put forth the effort required for the needs assessment.	2.66	1.79
POC3	I have put too much energy into this needs assessment.	2.88	1.86

ID	Item Description	Average Score N = 263	SD
POC4	The needs assessment required a reasonable amount of effort.	2.89	1.85
POC5	I was able to complete other tasks required of me while participating in the needs assessment.	2.29	1.64
POC6	The efforts I made to participate in the needs assessment are worth the benefits the organization will gain.	2.28	1.65

Participant Ratings on Perceptions of Practitioner Skills (PPS) Subscale Items

PBNAPS respondents were able to answer the six PPS items (α =0.84) up to two times if they had more than one known NA facilitator. Within the first round, respondents (*n* = 240) reported an average perceived burden score of 2.75 (*SD* = 1.27). Within the second round, respondents (*n* = 29) reported an average perceived burden score of 2.70 (*SD* = 1.27). Across both rounds, PPS5: *The needs assessment facilitator worked around my schedule* is the item with the highest reported average score (first round: *M* = 3.05, *SD* = 1.77; second round: *M* = 3.83, *SD* = 2.00). Participants across both rounds were also consistent in identifying the item against which they experienced the least amount of burden, PPS3: *The needs assessment facilitator explained their process in terms that I did not understand* (first round: *M* = 2.46, *SD* = 1.68; second round: *M* = 2.00, *SD* = 1.49). Table 9 provides a summary of the PPS subscale results.

Table 9

Summary of PPS Subscale Results

ID	Item Description	1st Round Average Score N = 263	1st Round SD	2nd Round Average Score N = 29	2nd Round SD
PPS1	The needs assessment facilitator was a good listener.	2.85	1.68	2.34	1.42
PPS2	I did not feel understood when interacting with the needs assessment facilitator.	2.80	1.71	2.69	2.02
PPS3	The needs assessment facilitator explained their process in terms that I did not understand.	2.46	1.68	2.00	1.49
PPS4	I trusted the needs assessment facilitator to carry out the needs assessment with the appropriate level of rigor.	2.68	1.60	2.48	1.79
PPS5	The needs assessment facilitator worked around my schedule.	3.05	1.77	3.83	2.00
PPS6	I was not confident in the needs assessment facilitator's skills.	2.63	1.75	2.83	2.19

Participant Ratings on the Perceived Systemic Sensitivity of the Practitioner (PSSP) Subscale Items

PBNAPS respondents were also able to respond to the PSSP subscale's seven items (α = 0.83) twice if they had more than one known facilitator. Within the first round, respondents (*n* = 237) reported an average PSSP score of 2.84 (*SD* = 1.18), while respondents (*n* = 29) reported an average PSSP score of 2.92 (*SD* = 0.85). Unlike the PPS subscale, participants differed in their reportings of the item with which they experienced the highest and lowest amounts of perceived burden. Within the first round, they reported the highest average perceived burden score against item PSSP7: *The needs assessment facilitator had very little influence on the organization's decision making* (first round: *M* = 3.45, *SD* = 1.62). Within the second round, they reported the highest average against PSSP2: *I did not feel understood when interacting with the needs assessment facilitator.* (*M* = 5.31, *SD* = 2.02). The item against which PBNAPS respondents reported the lowest average perceived burden was, PSSP5: *The needs assessment facilitator understood the culture of the organization* (*M* = 2.61, *SD* = 1.57). For the second round, the lowest scored item was PSSP6: *The presence of the needs assessment facilitator disrupted organizational productivity* (*M* = 2.07, *SD* = 1.22). Table 10 provides a summary of the PSSP subscale results.

Table 10

Summary of PSSP Subscale Results

ID	Item Description	1st Round Average Score N = 237	1st Round SD	2nd Round Average Score N = 29	2nd Round SD
PSSP1	The needs assessment facilitator valued my contributions to the needs assessment.	2.66	1.63	2.34	1.42
PSSP2	The needs assessment facilitator had a solid understanding of how the organization functions.	2.56	1.61	5.31	2.02
PSSP3	The needs assessment facilitator had difficulty navigating the organizational dynamics.	2.89	1.74	2.69	1.67
PSSP4	The interests of the needs assessment facilitator overshadowed my own interests.	3.09	1.89	2.52	1.83
PSSP5	The needs assessment facilitator understood the culture of the organization.	2.61	1.57	2.45	1.70
PSSP6	The presence of the needs assessment facilitator disrupted organizational productivity.	2.62	1.57	2.07	1.22
PSSP7	The needs assessment facilitator had very little influence on the organization's decision making.	3.45	1.62	3.03	1.90

Discussion

Debunking the Myth of Severe Levels of Burden in NAs

Perceptions are powerful. These mental impressions can influence experiences and decision-making. However, even commonly accepted perceptions do not always directly reflect reality. Because NAs can be falsely perceived as being too burdensome even though they contribute substantially to the ID process, it was important to examine whether or not these perceptions were factual. While the literature suggests NAs are not leveraged as much as possible (Aull et al., 2016), these results suggest that the perceived burden of participants and constituents should not serve as the excuse for such avoidance. This heterogeneous sample of NA participants reported relatively low levels of perceived burden across organizational contexts, affiliation types, and lengths of affiliation with those organizations. These results should help to dismantle incorrect perceptions of severe or elevated levels of burden when conducting NAs. Extreme, negative connotations falsely attributed to needs assessment are not always warranted.

Not only has this now debunked myth affected potential NA participants, but there are also implications for NA practitioners. In addition to assuaging the fear-based perceptions of NA, these data also suggest that ID practitioners should feel empowered in keeping NA within their toolbox and confidently incorporating needs assessment into their practice. In fact, this finding can arm practitioners with data and evidence to assuage any fears potential clients, customers, and participants may have when considering NA as a tool.

Implications for NA Practice

While this participant sample did not report overwhelmingly high burden levels, there are

lessons to be learned from where PBNAPS respondents reported their highest and lowest amounts of burden. For the myth of the burdensome NA to remain debunked, every effort should be made to ensure participants are not taxed unnecessarily. What participants do, what they give up, how they interpret the NA facilitator's competence and systemic sensitivities all play a role in their perceptions of burden. Since NA practitioners have the most agency in shaping the NA process, they can take action to ensure minimal burden. Some practical recommendations include making use of extant data collection and analysis, ensuring NA tasks and recommendations are reasonable, minimizing what participants must give up, remaining flexible, and seeking understanding.

Make Use of Extant Data Collection and Analysis

Based on the PBNAPS respondents' overall averages of perceived burden by component, the most burdensome component was Perceived Duties, Obligations, and Responsibilities (PDOR), where n = 242 (M = 3.67, SD = 1.07). What NA participants are asked to do can greatly influence their experience. Therefore, they deserve to have their active participation limited as much as possible. This can be accomplished by prioritizing extant data analysis, or document analysis (Stefaniak, 2020). Extant data include existing documents or visual materials created outside of the researcher's presence (Charmaz, 2006; Ralph et al., 2014; Salmons, 2016). The more that can be gleaned from extant data, the more the NA can be conducted without many impositions on NA participants (Altschuld & Kumar, 2010; Zemke, 1998).

Ensure NA Tasks and Recommendations are Reasonable

Many NA models end with determining recommendations or decisions to address performance needs (Watkins et al., 2012). Within the sample, the most burdensome aspect of their duties, obligations, and responsibilities had to do with participants' roles in carrying out the recommendations resulting from the NA. Much like the PBNAPS participants indicated that when NA tasks are perceived as reasonable, they feel less burdened, so too must the recommendations that emerge from NAs be reasonable. NA recommendations have systemic implications regardless of magnitude, such that any intervention will impact all of the organization's moving parts (Stefaniak, 2020). Recommendations have the best chances for adoption when they offer observable results with clear, relative advantages; are not overly complex; and are compatible with the existing organizational system (Kaufman & Guerra-López, 2013; Rogers, 2003; Surry, 1997).

Minimize What Participants Must Give Up

While the Perceptions of Cost (POC) subscale showed the lowest overall average of perceived burden for this sample, PBNAPS respondents indicated their highest perceived burden was in giving up other commitments to participate in the NA. Therefore, the more that NA tasks can be seamlessly incorporated into the participants' existing activities or duties, the less participants perceive they give up and potentially the less overall burden may have an adversely perceived impact. Though this sample indicated less burden because they knew their NA efforts would benefit the company, participant organizational loyalty will not justify overly taxing participants within the process. Even with company loyalty, NA participant interest and willingness to engage will likely decrease over time (Kaufman & Guerra-López, 2013). NA participant tasks must be convenient for them.

Remain Flexible for Participants

Similarly, PBNAPS participants reported high burden against the item indicating poor NA facilitator flexibility. In particular, respondents reported the highest average of perceived burden within the Perceptions of Practitioner Skills (PPS) subscale when their NA facilitators did not work around the participants' schedule. In this way convenience and NA facilitator flexibility go hand in hand (Pinckney-Lewis, 2021b). Remaining flexible within the NA process is required for real-world application and enhances the participant experience (Altschuld & Kumar, 2010; Watkins et al., 2012).

Seek Understanding

The notion of understanding came up in several instances within the PBNAPS results. First, within the PSSP subscale, respondents reported the lowest average perceived burden against the item portraying NA facilitators explaining the process to participants in a way the participants could understand. Making sure that participants can grasp what facilitators ask of them by using plain language and eliminating jargon is important (Pinckney-Lewis, 2021b; Zemke, 1998). Additionally, within the PSSP subscale, one of the highest average ratings of burden was where participants did not feel understood by the facilitator. So not only must NA participants understand the process, but, in turn, they must also feel understood, valued, and seen (Cervero & Wilson, 2006; Forester, 1989). Participants should feel a part of the process and not like the process is foreign or being done to them.

Limitations and Future Research

Lack of Existing Literature

One of the main challenges within the research is that there is not a long-standing body of work or literature to guide this inquiry. Examining participant perceptions of burden within NA is relatively novel. Though the PBNAPS was developed through a rigorous development and Beta review process, this work should still be considered in its infancy. Replications of this research across additional samples and organizational contexts is necessary to help establish a more explicit space within the literature.

Lack of “Not Applicable” and “Not Sure” Selection Options

Because the PBNAPS leveraged an odd-numbered Likert scale, the middle demarcation did stand in as the “Neither Agree nor Disagree” option. However, there were no options for respondents to indicate when they felt an item was not applicable to them or whether they were not sure if the item applied to them. For example, while the research did not exclude any NA experiences, two of the PBNAPS subscales did refer to the presence of a NA facilitator. In some NA practices where data are collected via survey, participants may be unaware there is a specific facilitator. For those items, respondents could indicate they “Neither Agree nor Disagree” with the statements referring to facilitators. However, “Not Applicable” or “Not Sure” options may actually be more accurate (Lee et al., 2007). Making these options available in future versions of the PBNAPS is worth pursuing, especially since it may influence the discrepancy analysis results.

Lack of Deeper Demographic Insight

Similarly, the PBNAPS only solicited high level demographic information regarding the respondents’ organizational context, their organizational affiliation, and their length of affiliation with the organization. While this is valuable, relevant information, it limits the interpretation of these results, which might be subject to self-selection bias (Bethlehem, 2010). Further research should account for this potential bias and investigate whether perceptions of burden within the NA process varies by race, gender, linguistic diversity, neurodiversity, and/or perceived agency relative to their role within the organization. Organizational environments are increasingly diverse, so taking a globalized and culturally sensitive participant perspective is essential (Altschuld & Watkins, 2014). While these results with the current sample were favorable, future NAs must continue not adversely impacting any contingency within an organization.

Conclusion

With the hefty task of facilitating learning and improving performance within various organizational contexts, ID practitioners need to be able to access all the tools within their toolbox to achieve that end. NA is a great resource to help understand the difference between the current state and the desired state of learning and performance (Altschuld & Kumar, 2010). The results of this study show that the myth of the overly burdensome NA can be debunked, at least for this sample of participants. These data can be shared with potential customers and clients as evidence that NAs are not as taxing as they may be rumored to be (Pinckney-Lewis, 2021b). The PBNAPS results are promising: the participant experiences reported here confirm that NAs cause more good than burden.

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Activity Theory as a Lens for Developing and Applying Personas and Scenarios in Learning Experience Design

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Theoretically-informed design is a hallmark of the field of learning and instructional design and technology (LIDT). Designing digital environments for learning on the basis of theory can lead to theoretically pure and potentially effective learning interventions, yet theory alone is insufficient to consider the myriad of issues that emerge while a learner is engaged in digitally mediated learning. As the field of LIDT shifts towards more human-centered design practice, the phenomenon of learning experience design (LXD) has emerged as a novel, multidisciplinary focus area. LXD equips designers with a range of useful methods for explicitly considering the learner within the learning context. Two methods that we argue are particularly well-suited for this are personas and scenarios. The development of personas and scenarios can be informed by activity theory, which provides a lens for holistically considering the technology usage context and the learner's role therein. The current article discusses the interplay of activity theory, personas, and scenarios, and illustrates how this can be potentially useful in learning experience design practice in two separate case examples. Implications are discussed.

Introduction

The field of instructional design has experienced a number of shifts that have influenced its focus, methods, and identity, ultimately reshaping and redirecting the field. Gagné's concept of instructional systems design gave way to the now-common moniker of instructional design, which in turn has been supplanted by the term learning design. These changes in terminology historically have been predicated by broader shifts in the philosophical underpinnings of the field. The roots of instructional systems design can be found in behaviorist theories of knowledge acquisition (Gagné & Briggs, 1974), which eventually led to more cognitivist perspectives (Schuh & Barab, 2008), which in turn gave way in the early 1990s to more constructivist approaches (Honebein, 1996; Jonassen, 1991). This consequently signaled a shift from more objective epistemological views to an understanding of knowledge as more subjective and individualistic

(Ertmer & Newby, 2013). With this came a recognition of the centrality of the learner to the learning process, and a move away from traditionally more instructor-centric approaches (e.g., Soloway et al., 1994). Key to learner-centric approaches is a recognition of the learner as central to the design process.

Theorists have increasingly begun to extend beyond cognitive and behavioral approaches to education and towards elements of human-computer interaction (HCI; Gray et al., 2020). More recently, theorists have begun to embrace elements of user experience (UX), which is used to design technologies in human-centered ways that are engaging, functional, and user-friendly (McLellan, 2000; Schmidt et al., 2020). Borrowing practices from user experience design (UXD) and applying them to learning design practice has led to productive application of associated methods and processes, with clear, practical value for the design of digital environments for learning (Dimitrijević & Devedžić, 2021; Haldane et al., 2019; Matthews et al., 2017; Shernoff et al., 2020). When UX methods are applied in the field of LIDT, the focus on the user of a technology system necessarily shifts to a focus on the learner-as-user of a given learning technology, e.g., learning management system, serious game, virtual learning environment, etc. (Jahnke et al., 2020). The learner experience (LX), therefore, can be characterized as an emergent quality influenced by many aspects of the learner's interaction with the given learning technology (Hassenzahl & Tractinsky, 2006; Schmidt & Huang, 2021). These include ease-of-use, appeal, context of application, learner's goal orientation, etc.

There is little argument that digital environments for learning should be designed in a way that effectively embodies learning theory and facilitates meaningful learning. However, designs of many existing digital environments for learning are conceived primarily from the perspective of a siloed learning theory. All too often, designers of such systems fail to consider the broader notion of LX (Gray, 2016). This is not to suggest a lack of expertise, but rather that considerations of LX from this more holistic lens has not been a central focus. This could be due to a myriad of challenges, including limited budgets, protracted timelines, a lack of buy-in with stakeholders, and so-on. Applying a siloed, narrow view of learning design introduces the risk of developing a digital environment for learning based on sound theory (e.g., cognitive load, cognitive flexibility) that lacks sufficient consideration of issues that are traditionally seen as more relevant to the field of HCI, for example, fluid navigation or minimalist design. This could lead to the design of a digital environment for learning that conveys the technical aspects of a content area, but is not necessarily enjoyable, pleasing, or easy to use. A purely theoretical orientation to design in itself might not take into account the myriad of variables that can influence a learner's individual experience while engaged in technology-mediated learning. For example, an interface, online course, or learning module that is difficult to use could impact learners' acceptance and perceived utility of the technology (Venkatesh et al., 2003) and ultimately could impede learning.

Learning designers are confronted by challenges on a range of fronts when attempting to apply UXD methods to learning design. One of the issues has to do with the lack of clarity around the concept of learning experience design (LXD). In the field of HCI, the term UX has become common parlance, although it is not well understood (Law et al., 2009). This is perhaps because UX consists of multiple variables that are not agreed-upon or consistently considered and because it lacks a coherent unit of analysis. In this sense, a parallel can be drawn between UX and LXD, in that terms and concepts related to LXD abound in practice, despite the lack of clear definitions and methodological frameworks (Schmidt & Huang, 2021).

Another challenge in LXD is how to contextualize individuals as they employ learning technologies. However, studies show that designers struggle regarding how to design the context that embodies the experience of users. In the realm of UX design, practitioners will often develop personas and scenarios to provide design context. These methods are equally valuable in learning design, as it is often difficult for designers to remain cognizant of the emergent needs of learners as they navigate the learning space, work with peers, and perform other learning tasks. Personas, in general, are archetypes of users who might employ the technology within their specific usage context (Miaskiewicz & Kozar, 2011). In learning design, specifically, personas are archetypes of learners who might engage in a learning activity using a learning technology (e.g., LMS, mobile app, serious game). Scenarios are narratives that describe user activity in a story format (Carroll, 2000). Both scenarios and personas can be incredibly valuable when employed for learning design.

We argue that personas and scenarios are a useful tool for situating learning designs within the lived experiences of individual learners. Traditionally, learner analysis and context analysis are recognized as critical aspects of instructional design. Articulating learner and contextual characteristics and deriving learner needs is most often performed within the context of front-end analysis. However, approaches to learner and contextual analysis can be quite general. Learner analysis methods tend to characterize learners based on measures relevant to a given content area (e.g., reading level, attendance, quiz results, performance metrics) and often are garnered through indirect means, for example from grade rosters or from interactions with subject matter experts (SMEs). Contextual analysis tends to take a narrow view, focusing primarily on the immediate context of learning (e.g., school, training program, etc.) as opposed to a broader conceptualization that might consider social, physical, and political factors. However, context plays a critical role in understanding the broader ecosystem that encompasses learning (Tessmer & Richey, 1997). Contextual factors are fundamentally and inextricably interconnected with learner considerations, such as prior knowledge, common experiences, shared social mores, etc. (Smith & Ragan, 2005). Socio-cultural factors shape cognition (Järvenoja et al., 2015), influence recall of prior knowledge and enhance meaning (Shepherd, 2011), and can promote transfer of knowledge and skills to novel situations (Tessmer & Richey, 1997). Our field has accepted that learners' operate and engage in meaning-making as negotiative practice within socio-cultural contexts (Brown et al., 1989). Indeed, "acts take their meaning in relation to the social worlds (or communities of practice or activity systems) in which individual actors participate and to the actors' positions or identities in those contexts" (Nolen, 2020, p. 1). Design methods that lead to deeper considerations of individual learners and take into account the broader socio-cultural ecology in which meaning-making is situated therefore could provide useful tools for instructional designers seeking to advance more learner-centered methods. To this end, personas and scenarios are promising; however, how they are situated more broadly within a design ecology must be articulated, which we discuss later in this paper.

The purpose of the current article is to highlight how one theoretical perspective that finds resonance in LIDT—activity theory—can be applied synergistically with specific methods of UXD—personas and scenarios—to inform the design of digital environments for learning. We argue this synergy allows for embodiment of theory while concurrently promoting positive learner experiences. Activity theory provides parameters for contextualizing technology usage within a framework that not only considers the interaction of the learner with the technology tool, but also the broader context within which that interaction takes place. In the following sections, we briefly describe activity theory and how it informs iterative design of digital environments for learning in a UCD process. Real-world case examples from our own learning design practice are provided. We conclude with a discussion of implications, and consider how similar approaches might be adopted by others in the field.

Activity Theory

Understanding learners' experiences when engaged in technology-mediated learning could benefit from a more holistic perspective of HCI (Barab et al., 2004; Nardi, 1996). One theory that finds resonance in both HCI and LIDT is activity theory. Activity theory argues that activity and consciousness are dynamically and inextricably interrelated. The theory considers the broader context and culture from which learning emerges, and thus has important implications for describing how learners think and reason within the world around them, how they engage in meaning-making, and how they develop understanding within their social context. In the field of LIDT, Jonnasen and Rohrer-Murphy (1999) explained it thusly: "conscious learning emerges from activity (performance), not as a precursor to it. So activity theory provides us with an alternative way of viewing human thinking and activity" (p. 62). From an activity theory perspective, actions are purposeful, social, mediated, multilevel, and developed through interaction between subjects and the objective world (i.e., objects). In doing so, activity theory explicates a variety of constructs to detail how an individual uses tools within an activity system and social context to engage in goal directed behavior (see Figure 1). From an end-user perspective, activity theory describes the individual and his/her role as it relates to the intersection of tasks (activity) and group-level work (action). As s/he completes a given task with available tools, s/he engages in goal-directed behaviors through established rules, such as norms and processes. Alternatively, the community can connect to the object through division of labor (Yamagata-Lynch, 2010). The theory is thus descriptive in that it takes into

consideration how individuals (a) manage the contextual constructs of division of labor, rules, and community and (b) employ technology for achieving specific outcomes.

Activity theory includes multiple LXD implications for designers of learning environments. First, activity theory as applied to LXD details explicit constructs important to the learning context, in juxtaposition to approaches that might focus more on a content-driven approach to learning design (e.g., flipped classroom). Rather than viewing content as a body of knowledge to be transmitted to the learner and subsequently attained, the cultural constructs of activity theory describe the broader context in which knowledge construction takes place. It follows that understanding this phenomenon requires one to critically consider the artifacts and technology that mediate that learning process (Kaptelinin & Nardi, 2018; Yamagata-Lynch, 2007) and how those constructs are situated and interoperate within elements of the activity system. Technology, therefore, is not only an instrument available to a learner for completing an action, but also plays a role in allowing meaning-making to emerge within a community (Barab et al., 2004). Therefore, meaning-making is not only an individual endeavor, but is also an emergent property of the entire activity system.

Figure 1

Activity system diagram

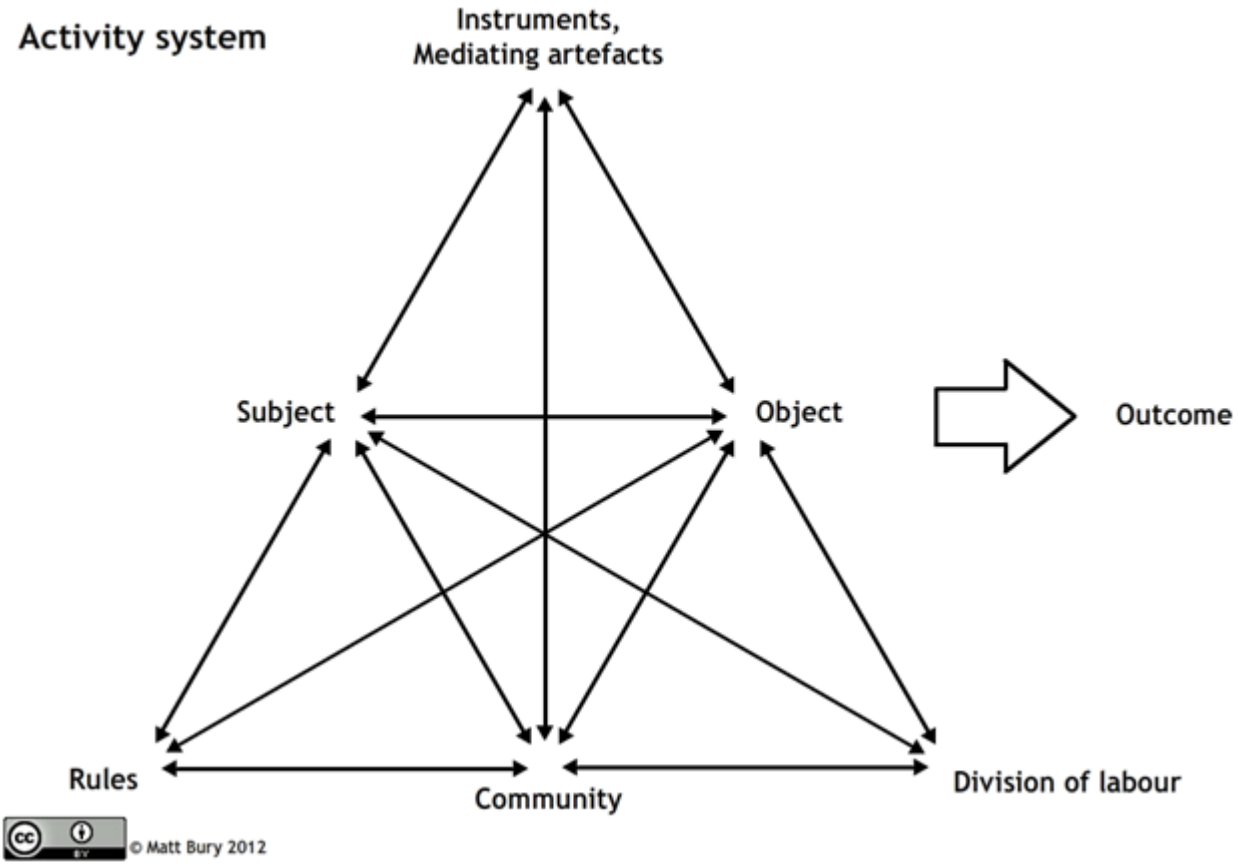


Diagram of an activity system as conceptualized by Engeström, illustrating connections between subject, instruments, object, and outcome, as well as rules, community, and division of labor. (Engeström, 2000). CC BY 2.0.

Although most learning designers consider learners from the perspective of needs assessment, consideration is largely absent in learning design of how learning activities connect with the broader bounds of the learning community (Gray et al., 2020; York & Ertmer, 2011). Given activity theory's emphasis on activity as a multifaceted and mediated phenomenon between the subject, tool and object, it "prompts the designer to look beyond the immediate operation or action level and to understand the use of the designed tool in terms of the more comprehensive, distributed, and contextualized activity. This shift places emphasis on understanding not simply the subject but the entire context" (Barab et al., 2004, p. 203). As opposed to a narrow view of embodying a specific theory or model within a technology

interface (e.g., cognitive load theory; ARCS model), an activity theory lens considers requisite technology features for affording specific actions towards learning goals, including how to interact with peers and share responsibility for tasks. Moreover, it allows designers to consider how implementing and/or changing technology tools might impact social dynamics and the learning process. Adoption of an activity theory lens by learning designers, therefore, has the potential to promote a more holistic and comprehensive view of learning as goal-oriented meaning-making activity, mediated by technological tools, and circumscribed by the broader context of the learning community, its rules, and its division of labor.

Development and application of personas and scenarios using activity theory

Designers of learning environments often approach development from a learning theory perspective to engender self-directed learning, motivation, and other learning outcomes. However, socio-cultural approaches suggest that designers of these environments should not only consider theories that circumscribe our understanding of learning, but also the broader contexts in which learning occurs (Jonassen et al., 1994). Activity theory explicates how learners might operate and navigate activity during a social learning process, thus aligning with theories rooted in Vygotskian social constructivism (Vygotsky, 1978) such as distributed cognition or situated learning theory. Therefore, activity theory could prove to be a useful tool for learning designers when applied in conjunction with established design practices (such as in the development and application of personas and scenarios) to elaborate the broader ecology of learning with technology. As it relates to LX and personas, activity theory can provide a more comprehensive understanding of how learning technology is used, by whom, under what conditions, with what kinds of supports, and for what kinds of outcomes. This provides a lens for designers to consider a broad range of issues towards the development of a learning environment that considers not only effectiveness, but also efficiency and appeal (Honebein & Honebein, 2015). In the following sections we provide case examples detailing this.

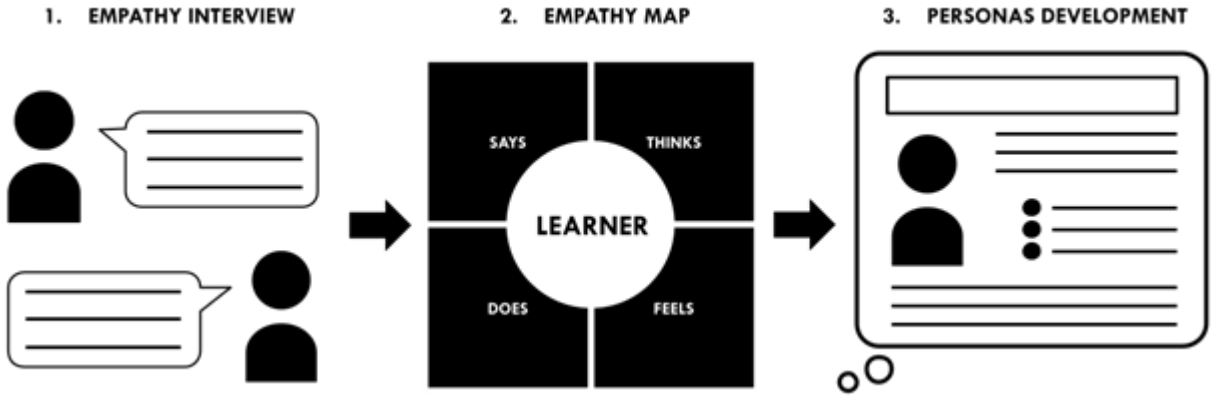
Case 1: Supporting Mobile Health Design Using Personas

Designing learning experiences within health contexts presents unique challenges. Learners are often patients with health conditions that impact their quality of life and general well-being. Stakes can be high, for example, for someone recently diagnosed with diabetes learning to take medications regularly to control debilitating symptoms, or for someone after sustaining a concussion learning how to gradually return to activities to improve recovery. However, learning designers seldom have direct experience with the myriad of health-related issues they may encounter in practice. Similarly, the SMEs with whom learning designers might collaborate (e.g., physicians, nurses) may have deep domain knowledge and practice-based experience but be professionally distant from the lived experiences their patients might face. In this case study, we describe how we used personas within our own design practice to promote empathy with patients and to better understand how we could design more holistically so as to meet their learning needs within their socio-cultural contexts.

Mobile health (mHealth) is defined as “the use of mobile computing and communication technologies in health care and public health” (Free et al., 2010, p. 1). mHealth applications have been shown to improve healthcare by reducing costs, promoting accessibility, and improving individualized treatment (Steinhubl et al., 2013). Increasingly, human-centered design approaches are being adopted to develop mHealth interventions, commonly referred to as patient-centered design (Chiauzzi et al., 2020; Hernandez-Ramos et al., 2021). Within this context, personas are often developed to guide design (Ayubi et al., 2014; Haldane et al., 2019). In our own mHealth design practice, we apply human-centered design methods within the frame of LXD. Our LXD process utilizes personas to guide mHealth design. Developing personas begins by performing empathy interviews with representative patients. Interviews are then transcribed, and salient quotes and topics are categorized using affinity mapping techniques (Lepley, 1999). These affinity maps are then used as inputs for developing patient personas (Figure 2), a process that bears some similarity to that described in Siricharoen (2021).

Figure 2

Process of creating personas through distillation of empathy interview data using empathy mapping techniques



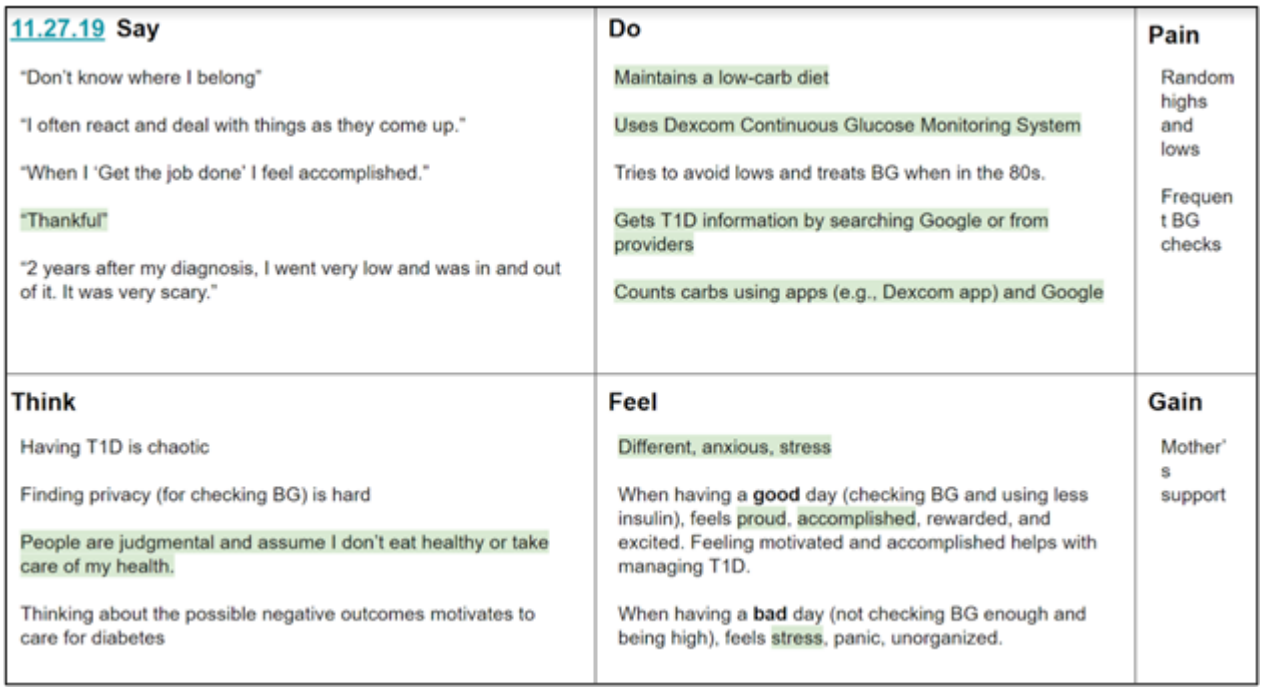
Process model diagram illustrating how personas can be created using empathy interviews and empathy maps

Our process of developing personas follows design thinking processes (Chokshi & Mann, 2018; Ector et al., 2020) that begin with empathy interviews and are followed by empathy mapping (Klamerus et al., 2019; Weijers et al., 2021). Although techniques such as empathy interviews, empathy mapping, and development of personas are widely used methods in UXD and design thinking circles, application of empathy methods in the field of learning design is less prevalent, but has garnered some attention both in research (e.g., Mehta & Gleason, 2021; Morel, 2021; Tracey & Hutchinson, 2019) and in practice (e.g., C. Gray et al., 2015; Matthews et al., 2017). Empathy interviews and empathy mapping are methodological tools that provide a means to learn what is important to learners, to reveal emotional and perhaps tacit insights, to explore behaviors, needs, and challenges, and ultimately to develop a deep understanding for the daily lived experiences of target learners. Empathy interviews take the form of a series of open-ended questions tailored to the situation and target users. In general, empathy interviews are one-on-one conversations that elicit stories about specific experiences of interviewees. Although interview questions are personalized, following a protocol helps interviewers advance "the principles of being intentional, human-centered, and equity-focused" (Nelsestuen & Smith, 2020, p. 2). Different from other types of interviews, empathy interviews aim to promote empathy, which requires interviewers to immerse, observe, and engage during the interviews (Doorley et al., 2018).

To distill key information from empathy interviews into discrete categories, we employ empathy mapping techniques. Empathy mapping was originally developed as a tool for gamestorming (D. Gray et al., 2010). To create an empathy map, learning designers categorize interview notes based on what the interviewee was saying, doing, thinking, and feeling. The newly organized information helps designers focus on the interviewee's emotions and experiences—central elements of human-centered design. Figure 3 presents an example empathy map developed in the context of blood glucose management for type 1 diabetes.

Figure 3

Empathy map developed in the context of type 1 diabetes management

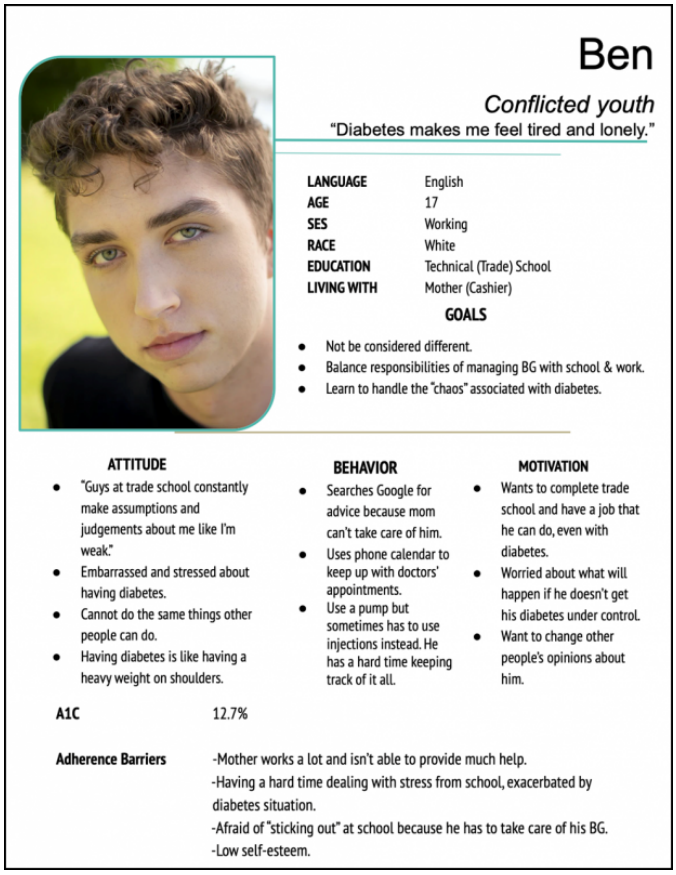


Example empathy map showing four quadrants, labeled "say," "think," "do," and "feel"

Following empathy interviews and empathy mapping, personas are developed. Within our three-stage process, personas are essentially artefacts of empathetic understanding that can be continually referenced across design phases. The multi-stage process of developing personas serves multiple purposes from a learning design perspective. First, the process brings the designer directly into contact with representative members of the target population and requires the designer to engage in deep, personal questioning so as to elicit aspects of everyday life and lived experiences of the people for whom the intervention is being developed. Next, because patients often relay intensely personal and challenging vignettes from their lives and how their quality of life has been impacted by health-related challenges, the experience can be visceral, emotional, and sometimes painful—descriptors that are not often associated with learning design. By eliciting participant narratives of lived experiences, learning designers are provided a lens through which empathy can develop, that is, they can develop shared understanding and experience with target learners by intentionally seeking to uncover details about other people's situations, feelings, and lived experiences. Finally, empathy interviews can serve as a conduit that can promote the emotional disposition of empathetic concern (Warren, 2018) and the cognitive dimension of perspective-taking (Gasparini, 2015) for LX designers. An example persona is provided in Figure 4.

Figure 4

Example persona of "Ben," an adolescent with type 1 diabetes who is struggling to manage his blood glucose levels

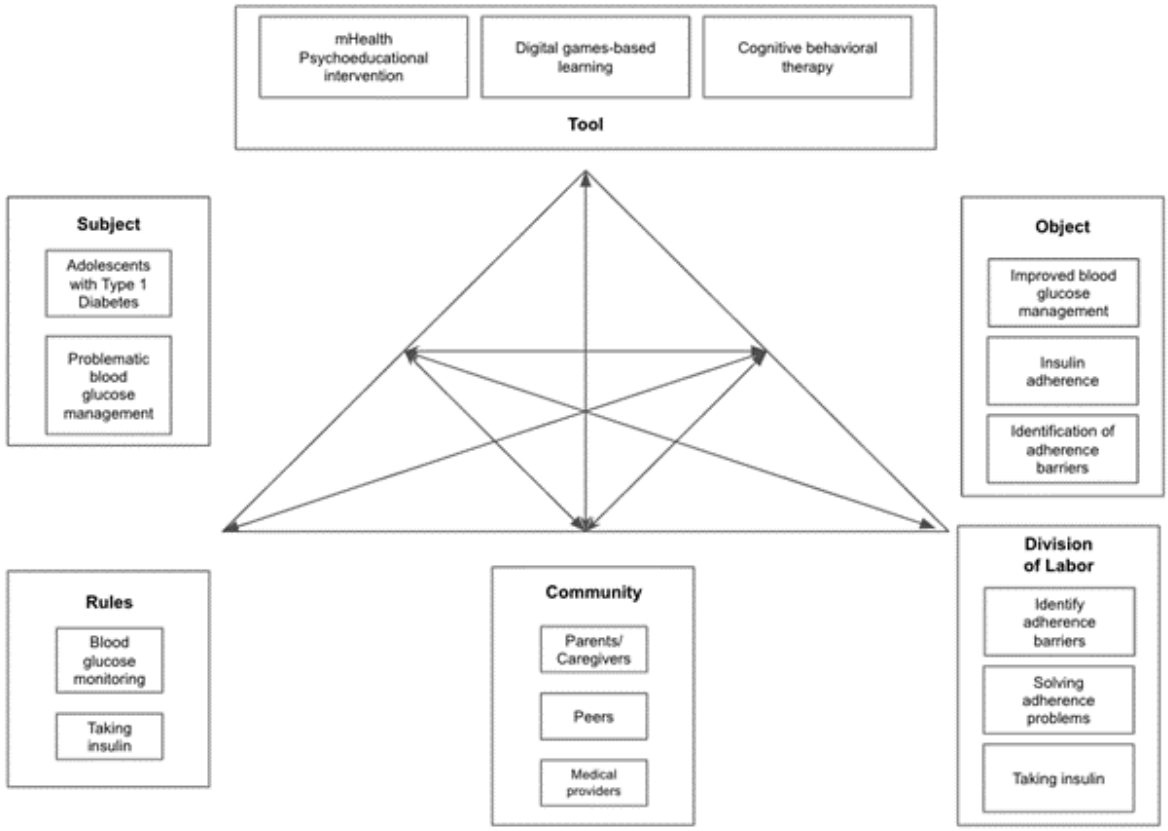


Example persona of a fictional user named Ben, an adolescent with diabetes. Persona includes information on demographics, attitude, behavior, motivation, and adherence barriers

Having established our process of persona development within the context of mHealth design, we now turn to theoretical considerations. Specifically, we consider how personas help to frame learning design from an activity theory lens. Different aspects of activity theory provided inputs for development of empathy interviews, so as to uncover aspects of lived experience that may be more tacit. For example, in type 1 diabetes blood glucose management, identification of subjects, tools, and objects is rather straightforward. However, consideration of rules, community, and distribution of labor unveils challenges that interrelatedly complicate blood glucose management. For example, we learned from empathy interviews that supporting insulin adherence is a community endeavor with multiple subjects involved, including parents/caregivers, healthcare providers, and peers, and that division of labor requires effective communication, often supported by a range of technologies. How this manifests is highly individualized and often develops unintentionally based on reaction to emergent challenges. This, in turn, results in localized rules that often are tacit and sometimes ineffective. Drawing an example from the persona in Figure 4, Ben's mother is supposed to remind Ben before school to check his blood sugar and take insulin, but she sometimes is at work and is unable to remind Ben. Not only does this result in undesirable outcomes related to taking insulin, this simple deviation resonates across the entire activity system in unpredictable ways, which potentially can amplify these undesirable outcomes. This has ramifications for learning design, and provides an opportunity for learning designers to consider not only how interventions can be designed to ameliorate these issues, but also how the intervention influences not only the outcome of potentially improved medication adherence, but also communication between subjects (community), making rules explicit and applying them with fidelity (rules), and understanding who is responsible for what (division of labor).

Figure 5

LXD of Diabetes Journey learning environment through lens of activity theory



Activity theory diagram that has been annotated with specific details from the Diabetes Journey case example

Case 2: Supporting Case Library Design Using Scenarios

The case of Nick's Dilemma illustrates how a learning environment can be designed based on sound theoretical foundations, but nevertheless fail to be used effectively due to insufficient consideration of how learners would interact with the technology within their specific learning contexts. The authors of this chapter were involved in a multi-phase, design-based research project to develop an online case library that would support learners in problem-based learning (Schmidt & Tawfik, 2018; Tawfik & Jonassen, 2013). In this problem-based learning (PBL) environment, the student reads about how the protagonist, Nick, must hire a new individual for his sales team with his boss, Sheila. The ill-structured problem outlines how Nick and Sheila are under intense pressure as they increasingly lose customers to market competition. The learner is confronted with three potential solutions to mitigate turnover within their medical device sales team. The learner can either (1) hire an internal candidate, (2) hire an external candidate, or (3) advertise the position again in a local newspaper. Each option has a range of benefits and drawbacks that the learner must identify and consider in making a decision.

The design team used the theoretical lens of case-based reasoning (CBR) to support novices as they used the PBL environment, a theory that rests on the notion that individuals use prior experiences stored in long-term memory to solve new problems. When an individual lacks any relevant prior experience to reference, they can be provided curated stories from a database (called a 'case library') to serve as 'vicarious memory' (Kolodner & Guzdial, 2000). According to CBR theory, learners read these digital cases and then apply the lessons learned towards the main problem to solve (Riesbeck & Schank, 2013). A CBR approach to PBL therefore mitigates a novice's experiential gap and uses similar cases as scaffolds from which learners can draw lessons learned (Tawfik & Kolodner, 2016).

The design team did not explicitly develop personas during their design, but instead inferred what a typical user would be like from needs assessment. Findings from needs assessment suggested that learners were upper-level juniors and seniors enrolled in a postsecondary Sales Management course at a large midwestern university. Conversations with the SME unveiled a concern that learners were too focused on finding the "right" answer while meeting the minimum

requirements of a given assignment, which led the SME to believe the students lacked the critical thinking skills needed for entering the workforce. From this, the designers inferred that the "typical learner" would be a college student enrolled in the marketing class. This learner would use the learning environment as intended to access a set of hyperlinked cases to solve the problem faced by Nick and Sheila. By providing learners with cases, they would be able to encounter "vicarious memories" that would provide a stand-in for the real-world experience that the SME felt was lacking.

While the learning environment was designed to align with many aspects of case-based reasoning, the assumed student persona lacked sufficient detail to consider how the learning environment would be used in context. Specifically, we failed to consider the process of learning with PBL, group dynamics, classroom culture, and other factors. Again, activity theory allows us to construct a scenario for the persona. To re-imagine this persona and scenario through activity theory, the learner (subject) attempts to resolve the problem faced by Nick and Sheila (objective). Given that the students had little or no experience, the database of related stories (case library) serves as the tool needed to help accomplish the task. Upon reflection, the top half of the activity pyramid (subject, object, tool) is well articulated and described by the lense of activity theory.

While the interface technically aligned with the tenets of CBR, activity theory articulates ways to situate the persona within the scenario as it relates to the rules, division of labor, and community within the activity system (Figure 5). For example, an important aspect of engaging in PBL includes the importance of learning from peers. However, our design failed to include any features that would support division of labor. If we evaluated our student persona and scenario through the lens of activity theory, we might have included features that supported collaborative learning and division of labor, including assigned tasks (e.g., information gathering), shared tasks, and artifact sharing. As it stood, students had to leverage other resources outside the learning environment to manage the division of labor, which could have presented challenges from a learning experience design perspective.

Consideration of our student persona through activity theory constructs identify other opportunities to improve the design. In this activity system, the community includes existing peer groups and classroom culture. The class was structured such that learners were assigned to groups near the beginning of class as they worked with their peers, which helped develop a smaller community among two to three peers. There was also the broader learning community of the business school, which emphasized portfolios and preparation for the business setting. If we had considered this as part of our persona and design, the learning technology could have included options to publish to their portfolio or possibly microcredentials/badges that reinforced the culture of the business school

Finally, activity theory also highlights the importance of rules. There are rules about university-wide initiatives (course conduct), but also rules on the course level rules related to due dates. We found that learners were especially mindful of the due dates for the final assignment, but this was not always easy to access and created unnecessary clicks to find this information within our initial design. There were additional rules about the assignment, such as the length and format, which required students to access. Other tangential rules applied, such as plagiarism, were not explicitly described within our learning environment.

In this instance, a scenario using activity theory could be as follows:

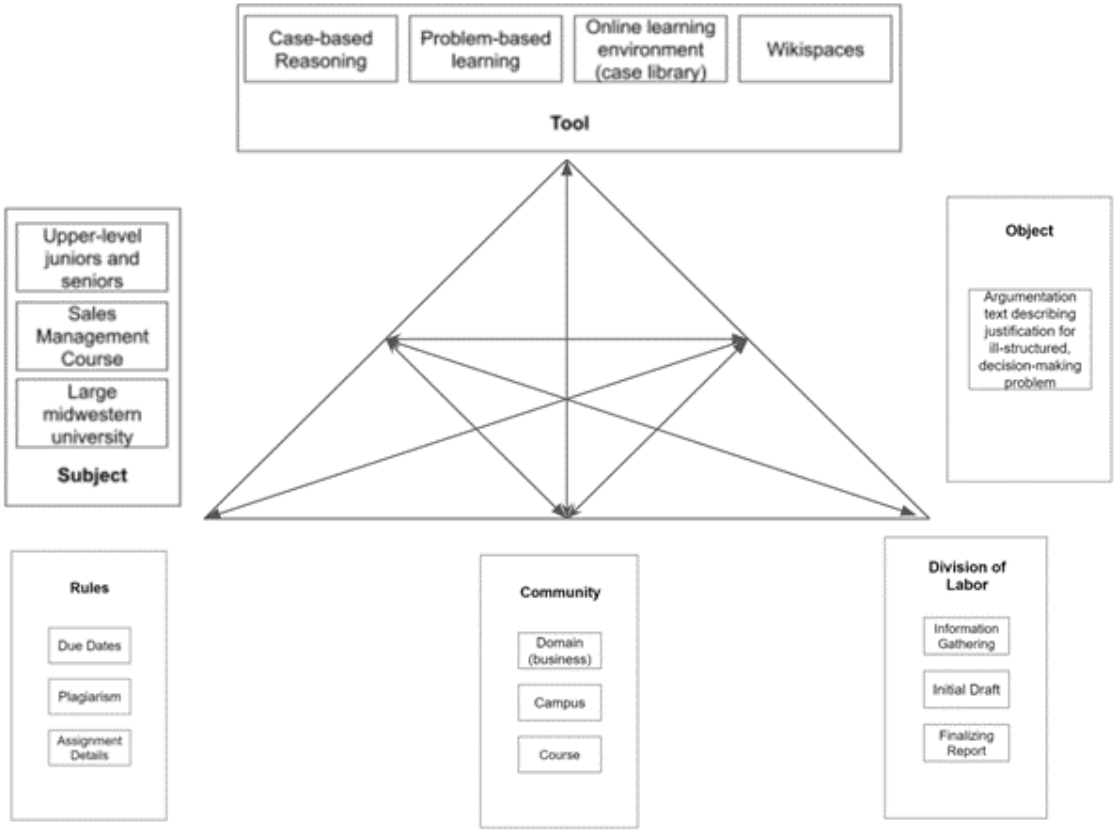
> *On Monday, Javy opens up his assignment tab in his LMS and noticed a newly assigned task from his instructor. As he reads the description, he notices that he needs to work with his assigned classmates and submit a two-page argumentative essay. It seems as though there are more details when clicking on the link, which he does.*
>
> *The main page has narrative at the top and directions on the bottom, such as how long the essay is and when to turn things in. The narrative says two weeks, although he's trying to line that up with the due date listed in the LMS. At the same time, he's not quite clear about whether or not he has to cite sources like he did with his prior assignments and classes in the business school.*

As he opens the screen, he reads the main problem to solve as it details Sheila and Nick must make a decision about how to build their sales management team. Throughout the narrative he also notices hyperlinks at what seems to be important decision points such as considering prior experience, hiring from within, or considering alternate individuals from outside the company. It's not totally clear, but it seems like the related cases are connected around these big ideas. By the time he's read the fourth case, he's frustrated because he's constantly hopping back and forth across the different tabs.

After he reads the problem to solve and related cases, he meets with his other group members (Taylor and Jaren). Taylor offers to read the cases and make a bullet point summary for each one, while Jaren offers to look for some additional sources such as his textbook. It's a little unclear how they will share the resources at first, but eventually they decide to each upload a document to cloud storage and they will try to reconcile what has been learned across the various sources. Because this is an online course, they'll mostly share their ideas via the class discussion board. Once that is done, Javy offers to draft an initial version of the argumentation essay and then share it for his peers to view. Once they review, he double checks the assignment again as to whether one person needs to submit it or if each individually has to submit. Finally, he uploads an additional copy for the business portfolio that he needs to submit to the College of Business prior to graduation.

Figure 6

LXD of Nick's Dilemma learning environment through lens of activity theory



Activity theory diagram that has been annotated with specific details from the Nick's Dilemma case example

Whereas our initial design was focused on a learner (subject) employing the case library (tool) to submit an argumentative essay (objective), an activity theory-driven persona and scenario could have caused us to consider easy access of the assignment description to minimize unnecessary navigation. The interface could have also linked to additional rules, such as plagiarism and due dates, that were already established. In doing so, this would have allowed

us to expand beyond a siloed understanding of the persona and thus allow the design team to better consider the overall learner experience.

Conclusion

As educators increasingly employ technology to support learning, there is a need to design and develop tools that effectively support the knowledge construction process. In many cases, theories that guide LX are rarely prescriptive and only recently emerging, therefore specific guidance for how they might be applied to design is lacking. While previous approaches may be content-driven (e.g., flipped classroom) or informed by theory (e.g., cognitive load), they may not consider the full extent of the learning experience design. Determining how to balance educational theory inspiration with the broader learner experience is ultimately left to the discretion of the learning designer. This is an area in which learning designers potentially can benefit from UXD methods and processes. Indeed, some learning designers have begun to adopt these methods. However, research suggests that learning designers tend to incorporate UXD methods and processes in ways that are incomplete and rudimentary. For example, learner personas might be developed, but then never referenced or used to inform design. UXD processes like wireframing or rapid prototyping might be employed, but without evaluating the designs with actual learners. Learning designs might be evaluated, but in simplistic ways such as quasi-expert review or other ad-hoc approaches. More robust processes are available, but are not often used.

One way to enhance the socio-technical design of learning environment is by espousing a human-computer interaction perspective, which allows us to not only consider what the s/he is learning, but the unique interactions that impact their learning process. HCI perspectives explicate methodologies and issues related to usability, but they also detail broader socio-cultural context of the user. To date, activity theory has been used to describe how individuals work together in many collaborative learning contexts. This theory further posits that individuals (subjects) seek out context-specific tools to achieve targeted tasks (object). However, the subject does not complete this task in isolation; rather, they different tools to complete the activity within their settings. Activity theory further outlines how s/he is connected to a social group as they complete said activity, which are often then used to divide responsibilities among the group members (division of labor) (Engeström, 2017; Sannino & Engeström, 2017). Finally, rules are the informal and formal regulations that govern the task and group dynamics (Yamagata-Lynch, 2010), which are used to describe the importance of social learning and peers scaffolding (MacLeod & van der Veen, 2020).

We argue that the constructs detailed in activity theory can address some of the challenges that designers face, especially as it relates to creating personas and the scenarios where learning takes place. Indeed, Gray (2016) cautioned that “even when designers believed in the value of personas, they did not use this perspective in their visible design processes. What this might suggest is some disjuncture between reported use of methods and the actual design activity” (p. 4045). The literature suggests problems arise because personas are often ill-defined (Chang et al., 2008), lack clarity (Holden et al., 2017), and used in ways not directly tied to design (T. Matthews et al., 2012). Using activity theory to construct scenarios for personas can help elucidate some of the contextual considerations of how a user engages in the learning process with technology. Activity theory applied to personas can develop scenarios that highlight the role of technology, but also the user’s community, rules, and division of labor where the learning takes place. By detailing a more holistic context of the learner, design approaches that utilize activity theory can thus be used as a mechanism to identify limitations and improvements for digital learning environments. In doing so, designers can develop environments that better consider learner’s dynamic interactions within their socio-cultural context.

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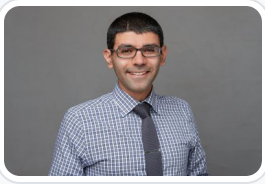

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Conducting a Formative Evaluation on a Course-Level Learning Analytics Implementation Through the Lens of Self-Regulated Learning and Higher-Order Thinking

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Self-regulated learning (SRL) and higher-order thinking skills (HOTS) are associated with academic achievement, but fostering these skills is not easy. Scholars have suggested an alternative way to scaffold these important skills through learning analytics (LA). This paper presents a formative evaluation of a course-level LA implementation through the lens of self-regulated learning (SRL) and higher-order thinking skills (HOTS). We explored the changes in students' SRL, HOTS, and perceptions at the end of the course term. Results indicate an increase in some elements of SRL and HOTS, and positive student perceptions. Discussion on implications and opportunities for informing future teaching strategies and course design reiteration are included.

Introduction

Research literature documents the crucial role of self-regulation on students' academic achievement (Broadbent, 2017; Credé & Kuncel, 2008; Nevgi, 2002; Pintrich & de Groot, 1990; Richardson et al., 2012). Students with higher-order thinking skills (HOTS) also tend to be academically successful (Tanujaya et al., 2017) and have strong metacognition and performance calibration essential to self-regulated learning (SRL) (Isaacson & Fujita, 2006; Maki, 1995). There is a direct effect of fundamental SRL strategies on students' HOTS (Lee & Choi, 2017). Put simply, HOTS and SRL are interrelated and play a fundamental role in determining one's academic success.

Fostering students' HOTS and SRL is not simple (Koh et al., 2012; Nouri et al., 2019; Yen & Halili, 2015). Therefore, some scholars adopt learning analytics (LA) to assess to what extent students deploy specific strategies during the learning process (Tabuenca et al., 2015; van Horne et al., 2017; Yamada et al., 2016, 2017; You, 2016). Students' digital traces can be analyzed for learning behavior patterns to inform interventions that foster exemplary behaviors (Roll & Winne,

2015). Research has also shown that implementing LA helps foster SRL (Tabuenca et al., 2015; van Horne et al., 2017; Yamada et al., 2016, 2017; You, 2016). Despite the benefits of LA, translating data from LA into actionable interventions at the course level is complex and still rare (van Leeuwen, 2019).

This paper presents a formative evaluation conducted at the course level. We utilized Learning Management System (LMS) usage data and an LA framework synthesized from existing literature. The LMS data allowed the instructor to decide when to employ interventions that promoted HOTS and SRL. This formative evaluation included an investigation of student SRL and HOTS using pre- and post-surveys, both of which included closed-ended and open-ended items. Essentially, we traced any changes in student SRL and HOTS after the instructor performed data-informed interventions by following a synthesized LA framework based on the works of Ifenthaler and Widanapathirana (2014), Muljana and colleagues (2021), and Muljana and Placencia (2018). Our findings will be incorporated into future instructional strategies and course design reiteration to encourage SRL and HOTS through an LA implementation.

Literature Review

Applications of LA should align with learning contexts; therefore, it is essential to implement LA in conjunction with an existing learning theory or construct (Gašević et al., 2015). In this evaluation, we utilized LA in parallel with promoting students' SRL and HOTS

Description of Learning Analytics

LA refers to "the measurement, collection, analysis, and reporting of data about learners and their contexts, for the purpose of understanding and optimizing learning and the environment in which it occurs" (Siemens & Long, 2011, p.32). This definition yields two key points (Muljana & Luo, 2021; Muljana et al., 2021; Muljana & Placencia, 2018). Data collection, analysis, reports, and similar measurements should first consider the learners' learning context. This can include study time, length of study time, access to materials, discussion participation, student reflection, and grades (Dietz et al., 2018). Second, the goal of employing LA is to optimize learning. Tracking students' digital traces makes it possible to analyze and diagnose learning progress, struggles, and successes to inform decisions regarding any interventions necessary to promoting learning outcomes (Casey & Azcona, 2017; Dietz-Uhler & Hurn, 2013; Macfadyen & Dawson, 2010). In other words, information about student learning behaviors from LA can be used by instructors to corroborate their instincts, detect student struggles, and advise immediate interventions (Dietz-Uhler & Hurn, 2013; Muljana & Luo, 2021; Muljana et al., 2021; Muljana & Placencia, 2018).

Self-Regulated Learning

SRL is proactive learning activities or process involving learners' thoughts, behaviors, and affects that systematically and strategically assist them in achieving their goals of improved learning (Zimmerman, 2002, as cited in Dabas et al., 2021). Students who possess self-regulation skills assess the situation, set goals, conduct and monitor their strategies, self-evaluate the outcome, and self-adapt to any improved strategies. In other words, the use of SRL involves students' cognitions, behaviors (Zimmerman, 1989), and affects (e.g., self-satisfaction) (Zimmerman, 2002), and requires continual iteration. When students self-adapt, they also set new goals for the next learning activity. Among all SRL elements, there is a clear interrelationship between metacognition and regulation (Binbarasan-Tüysüzoğlu & Greene, 2015; Karabenick & Zusho, 2015); students tend to perform better if they continuously regulate their efforts according to their metacognitive awareness about their learning process and progress. In our formative evaluation, we focused on two SRL elements: metacognition and effort regulation.

While an individual's proactive action is essential to SRL, external factors like study environment, available time to study, access to learning resources, instructional guidance, and instructional conditions play a role in SRL development (Gašević et al., 2016; Winne, 2011, 2017). Yamada et al. (2017) recommend course elements that intentionally promote students' self-efficacy and cognitive learning strategies because these variables support SRL skills. Broadbent (2017) further recommends scaffolding methods, such as providing learning opportunities and assessments that promote goal setting, planning, and reflection, be integrated into course design to encourage students to adopt SRL strategies.

Several studies connect LA with SRL. For example, student responses to Pintrich et al. 's (1991) Motivated Strategies for Learning Questionnaire (MSLQ) can be analyzed and correlated with the timeliness of assignment submissions (Yamada et al., 2016, 2017). MLSQ items can also be correlated with student SRL and their access frequency to real-time feedback provided by LA dashboards (van Horne et al., 2017). Still, while many LA-related studies focus on measurement purposes, the emphasis on teaching practices using LA to support students deserves further attention (Viberg et al., 2020).

Higher-Order Thinking Skills

We adopted the following overarching description of HOTS: "higher-order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations" (Lewis & Smith, 1993, p. 136). Students with HOTS perform beyond the literal interpretation of information to expound and use reason to build representations from it (Newman, 1990; Resnick, 1987). The professional world demands HOTS (Rotherham & Willingham, 2010; Silva, 2009) that instructional strategies and a well-designed learning environment can scaffold (Heong et al., 2011; Yen & Halili, 2015). HOTS allow students to become independent thinkers, problem solvers, and decision makers, and to facilitate the transfer of these abilities into real-life situations in the professional world (Rotherham & Willingham, 2010; Silva, 2009).

Students acquire HOTS during the learning process by identifying tasks and problems, clarifying components required by problems, judging related information, and evaluating information acquired and procedures for problem-solving (Quellmalz, 1985). These activities promote students' self-awareness about their thinking, self-monitoring, and problem-solving strategies (Quellmalz, 1985). HOTS involve the execution of critical, logical, reflective, metacognitive, creative thinking, and self-regulation skills (Mainali, 2012; Resnick, 1987; Zohar & Dori, 2003). Metacognitive thinking, self-regulation, and critical and reflective thinking all overlap with SRL elements. During the learning process, critical thinking helps students select, test, evaluate, adopt, and adapt suitable learning strategies in various learning contexts (Brown et al., 1993; Hadwin & Oshige, 2011). As students evaluate the impact of their learning strategies on learning outcomes, they use reflective thinking to improve their learning process (Isaacson & Fujita, 2006). We focused on investigating critical and reflective thinking during our evaluation.

A small number of recent studies have explored the intersection of HOTS and LA. For example, visual LA tools have been used to investigate students' activities annotating reading materials and commenting on other annotations, which positively impact critical reading achievement (Koh et al., 2019). Learning assisted by visual LA tools also influences students' higher-order thinking (Zhang & Chan, 2020). However, these studies do not provide practical guidelines to translate LA data into immediate actions.

Using Learning Analytics at the Course Level

Ifenthaler and Widanapathirana (2014) developed an LA matrix outlining the benefits of using LA from predictive, formative, and summative perspectives. Predictive LA helps foresee outcomes and determine future strategies when conducted early on. Formative LA uses real-time data to help instructors decide whether to intervene. Summative LA can give insights after learning events. In our two previous works, we built upon Ifenthaler and Widanapathirana's (2014) matrix to develop two similar LA frameworks (Muljana et al., 2021; Muljana & Placencia, 2018) that used three analytic perspectives. For the present evaluation, we synthesized those frameworks and adapted them into three phases: (1) early diagnosis, conducted at the start of the semester; (2) formative diagnosis, conducted throughout the semester; and (3) summative diagnosis, conducted partly during and partly at the end of the semester. Table 1 details each phase.

Table 1

Three Phases of LA

Starting point	Phase 1: Early diagnosis	Phase 2: Formative diagnosis	Phase 3: Summative diagnosis
Performing sound-pedagogy course design as a foundation	Consider assigning: • Entrance survey • Pre-test • Ice-breaker discussion	Identify: • Any difficult topics • At-risk students • Less-engaged students	Analyze and/or identify: • Overall student outcomes • Online discussion • Exit survey results • Students who excel or fall behind
Data analyzed: • Survey results • Test item analysis • Discussion posts • Course usage data	Data analyzed: • Test item difficulty • Assignment submission timestamps • Course usage data • Discussion posts	Data analyzed: • Final grades • Summary of course usage data • The number of discussion participation • Module(s) with most or least access • Exit survey results	
Take the following immediate actions: • Give clear expectation • Provide SRL and HOTS strategy tips (e.g., motivating message through announcement, tips related to goal setting, time management and selecting learning strategies)	Take the following immediate actions: • Add remedial materials or provide a review • Provide SRL and HOTS strategy tips • Reflect on the current course design and adjust it • Intervene any online discussions to encourage more dialogues that promote critical thinking • Reflect on the current instructions or prompts and adjust the clarity in the next module	Take the following immediate actions: • Reflect on instructor's strategy performed during the semester • Consider applying the successful strategies for the next cohort • Consider student feedback to inform the next course design iteration • Improve the course design in the next iteration	

Note. The LA approach includes three phases, synthesized from existing frameworks (e.g., Ifenthaler & Widanapathirana, 2014; Muljana et al., 2021; Muljana & Placencia, 2018).

Instructors can conduct early diagnosis using data from entrance surveys, pre–tests, ice–breaker discussions, and course usage logs. They can review the data to learn students' goals for taking the course and students' prior knowledge and experience. Instructors can then use that information to provide clear expectations and instructions, and offer SRL and HOTS strategy tips through weekly briefings.

Instructors can implement formative diagnosis to detect challenging topic(s), potentially at-risk students, and less-engaged students. They can analyze data like submission timestamps, test difficulty reports, course usage records, and discussion posts. Instructors can then intervene and suggest remedial materials, share SRL and HOTS strategy tips, adjust course design, encourage discussion dialogues, and adjust instruction clarity in subsequent modules.

Instructors can review summative diagnosis such as overall student outcomes to identify students who excel or lag behind so as to observe their engagement level. They can also analyze course usage summaries, participation numbers, and module access to inform decisions for adjusting instructional strategies and course design for future cohorts.

Formative Evaluation Questions

From the lens of SRL and HOTS, we conducted a formative evaluation on an LA implementation performed at a course level. We used an LA framework synthesized from existing literature (Ifenthaler & Widanapathirana, 2014; Muljana et al.,

2021; Muljana & Placencia, 2018) to observe students' learning progress and inform the instructor's interventions to adjust teaching strategies and improve student learning (see Table 1). As "the function of formative evaluation is to improve" (Nieveen & Folmer 2013, p. 158), our findings will be used to inform instructional strategies and course redesign for subsequent cohorts. Three questions guided this evaluation: (1) Did the LA implementation increase student SRL by the end of the semester? (2) Did the LA implementation increase student HOTS by the end of the semester? (3) How did the students perceive changes in their SRL and HOTS by the end of the semester?

Evaluation Methods

We adopted a case study approach for this formative evaluation. We use pre- and post-surveys (i.e., closed- and open-ended items) to understand student SRL and HOTS, including their perceived understanding toward their own SRL and HOTS. We selected the case study approach because it allowed us to comprehend a contemporary, complex phenomenon (Yin, 2008). In our context, applying LA at the course level is an emerging practice. The practice of translating data from LA into actionable interventions at the course level is still a rarity (van Leeuwen, 2019), and may require instructors to use complex processes (Molenaar & Knoop-van Campen, 2018; Wise & Jung, 2019). The case study approach guided us to explore how an LA implementation supported student SRL and HOTS, allowing us to highlight the practical significance of the results (Newman & Hitchock, 2011).

In this formative evaluation, we analyzed the data from one instructor who taught two course sections on the same topic: one with an LA implementation, the other without. Analyzing these two cases allowed us to examine each situation (Yin, 2008) by whether the LA implementation contributed to any SRL and HOTS changes or not. Given the small number of participants in this formative evaluation, we only used descriptive statistics to answer the evaluation questions regarding the pre- and post-comparison. These gave insight on how to improve our strategies and course design, as well as to inform readers about a potential LA implementation that can enhance SRL and HOTS.

Participants and Context

After receiving approval from the Institutional Review Board, we recruited students from two identical course sections of an upper-level general education course for an engineering program. This course applied economic theory to solve managerial problems and make decisions related to capital allocation for private, public, and governmental sectors. Twelve students participated in this study: four students from course section 1 and eight from course section 2 (see Table 2). We assured their anonymity, and they signed an informed consent form.

Table 2

Demographic and Contextual Information of Evaluation Participants

Demographic information	Students from course section 1 (Case 1) (N_1 = 4)	Students from course section 2 (Case 2) (N_2 = 8)
Gender		
Female	0	2
Male	3	6
Do not wish to mention	1	0
Class standing		
Freshman	0	0
Sophomore	0	1
Junior	2	2
Senior	2	5
Enrollment status		
Part-time	0	1

Demographic information	Students from course section 1 (Case 1) (N_1 = 4)	Students from course section 2 (Case 2) (N_2 = 8)
Full-time	4	7

Both classes met twice a week using a traditional, face-to-face format. The instructor used a Blackboard LMS to host course materials and facilitate both learning tasks and assessments. The courses utilized a Quality Matters (QM) template built by the university to follow quality course design standards. Course content was segmented into 12 modules and sequenced strategically to present the fundamental topics initially before the more complex ones. The LMS includes built-in data-analytics features, such as Course Reports, Performance Dashboard, and Early Warning System, that record overall course usage, students' submission activities, and submission timestamps. The Item Analysis feature within the Grade Center in the LMS allowed the instructor to analyze quiz difficulty and overall students' performance by question.

Instrumentation

We used a questionnaire consisting of demographic-related items and selected sub-scales from the MSLQ (Pintrich et al., 1991) to assess students' prior SRL and HOTS, as well as improvements. We specifically chose the following MSLQ sub-scales: (a) 12 items of Metacognitive Self-Regulation for assessing SRL; (b) four items of Effort Regulation for assessing SRL; and (c) five items of Critical Thinking for assessing HOTS. We also adopted four items from the Reflection sub-scales of the Reflective Thinking Questionnaire (RTQ) by Kember et al. (2000) to assess HOTS. MSLQ is one of the frequently used instruments for assessing SRL strategies (Panadero, 2017; Tong et al., 2020). As cited in Muljana et al. (2021), previous research utilizing MSLQ reported good reliability and validity with Cronbach alpha values between 0.62 to 0.93 (Cho & Shen, 2013; Hederich-Martínez et al., 2016; Kim & Jang, 2015; Li et al., 2020; Stegers-Jager, et al., 2012). RTQ also showed good reliability and validity in several studies, with Cronbach alpha values ranging between 0.62 to 0.91 (Asakereh & Yousofi, 2018; Ghanizadeh, 2017; Ghanizadeh & Jahedizadeh, 2017; Safari et al., 2020; Tsingos-Lucas et al., 2016). In total, we used 25 items from both MSLQ and RTQ in pre- and post-surveys, but excluded some demographic items from the post-survey and included three open-ended questions. The open-ended questions in the post-survey asked students' whether they perceived any changes in their SRL and HOTS.

Procedures and Data Collection

Formative evaluation took place in two course sections: section 1 (Case 1) and section 2 (Case 2). The same instructor taught both sections on the same topics using the same instructional resources. The instructor conducted the LA phases (as listed in Table 1) in Case 2; but, purposefully, not in Case 1. In week 1 and week 2, the students from both cases completed the pre-survey, and the instructor covered the content of Module 1 and Module 2 that served as the foundation of the more advanced topics in the subsequent modules or weeks. Within Module 3 to Module 12, the instructor included one weekly quiz at the end of each module in Case 1. However, the modules for Case 2 included two weekly quizzes (for mid-module and at the end of a module). The post-survey was made available in week 14, and students had two weeks to complete it. Table 3 lists the overall procedures in both cases.

Table 3

The Formative Evaluation Procedures

When	Case 1 (Course section 1)	Case 2 (Course section 2
Week 1 and week 2	Assigning pre-survey	Assigning pre-survey
Week 3 or 4 through week 14 (At this point, the instructor covered the content of Module 3 through Module 12)	Assigning a weekly quiz at the end of each module	Assigning two weekly quizzes: 1. in the middle of each module 2. at the end of each module Performing the LA three phases (as listed in Table 1) throughout the semester

When	Case 1 (Course section 1)	Case 2 (Course section 2
Week 14 and week 15	Assigning post-survey	Assigning post-survey

Note. Data were collected from pre- and post-surveys.

Data Analysis

We exported the pre- and post-survey results into a Microsoft Excel spreadsheet. We, then, analyzed these data using the Statistical Package for the Social Sciences for descriptive statistics. Due to the small sample size, we conducted no inferential statistics.

We analyzed the open-ended responses using the structural coding technique. This coding technique utilizes content-based phrases "representing a topic of inquiry to a segment of data that relates to a specific research question" (MacQueen et al., 2008, p. 124, as cited in Saldaña, 2013, p. 84), and is suitable for analyzing open-ended survey responses (Saldaña, 2013). Using structural coding, the first author simultaneously coded and categorized students' open-ended responses by identifying segments of responses displaying commonalities (Saldaña, 2013), guided by the third question itself and related topics. As stated by Saldaña (2013), structural coding is "framed and driven by a specific research question and topic" (p. 87).

We used three a priori topics related to the third question. For example, students must select and monitor suitable learning strategies when conducting an SRL phase (Zimmerman, 2002). Thus, the first a priori category represented students' perceptions of any changes in their learning strategies. Second, instructors' guidance played an imperative role in SRL development (Gašević et al., 2016; Winne, 2011, 2017). So, the second a priori category guided us to analyze students' perceptions about instructional guidance. Third, our literature review indicated students with HOTS could become independent thinkers, problem solvers, decision makers, and facilitate the transfer of these analytical thinking abilities into real-life situations in the professional world (Rotherham & Willingham, 2010; Silva, 2009). Hence, the third a priori category guided us to analyze perceptions regarding transferable, analytical thinking skills that students gained. The first author, next, presented all analyzed categories to the second author for feedback. They discussed the analyzed categories and resolved any disagreements (See Tables 6 and 7 for the highlighted categories resulting from the structural coding techniques).

Results

Changes in SRL

Comparing pre- and post-survey results, Case 2 showed better average score increases for each variable (see Table 4). For example, while the average score of metacognitive self-regulation did not increase in Case 2, it slightly decreased from 3.25 to 3.08 in Case 1. Students' average effort regulation scores also increased from 3.28 to 4.50 in Case 2, more than one point higher than for Case 1.

Table 4

Results of Pre- and Post-Surveys Assessing Self-Regulated Learning

SRL Variables	Case 1 (N_1 = 4)					Case 2 (N_2 = 8)				
Pre-M	Pre-SD	Post-M	Post-SD	$M_{difference}$	Pre-M	Pre-SD	Post-M	Post-SD	$M_{difference}$	
Metacognitive self-regulation	3.25	.38	3.08	.62	-.17	3.45	.40	3.45	.40	.00
Effort regulation	3.06	.88	3.75	1.06	.69	3.28	.41	4.50	.52	1.22

Note. 1=Strongly Disagree, 5=Strongly Agree

Changes in HOTS

Students' critical thinking scores decreased slightly in Case 1 (M = 3.75 to M = 3.65), while those of students in Case 2 increased (M = 3.45 to M = 3.78). Students in both cases self-rated reflection strategy lower by the end of the semester; however, there was a larger decrease among students in Case 1 ($M_{difference}$ = -.62). Table 5 lists pre- and post-survey results for HOTS.

Table 5

Results of Pre- and Post-Surveys Assessing Higher Order Thinking Skills

HOTS Variables	**Case 1 (N_1 = 4)**					**Case 2 (N_2 = 8)**				
Pre-M	Pre-SD	Post-M	Post-SD	$M_{difference}$	Pre-M	Pre-SD	Post-M	Post-SD	$M_{difference}$	
Critical thinking	3.75	.55	3.65	.38	-.10	3.45	.76	3.78	.88	.33
Reflection	4.12	.85	3.50	.84	-.62	4.31	.32	4.12	.42	-.19

Note. 1=Strongly Disagree, 5=Strongly Agree

Perceived Changes in SRL and HOTS

Case 1

To apply SRL, students must select and monitor suitable learning strategies (Zimmerman, 2002). Thus, we asked students whether they changed such strategies. Three out of four students in Case 1 reported they used the same learning strategies since the beginning of the semester. As one student noted, "My strategies are the same as they were. Pay as much attention in class as possible and supplement with textbook or internet knowledge as needed."

Students had positive comments about HOTS, despite the absence of the LA implementation. They noted gaining or boosting their skills in the application and analytical-thinking HOTS domains. For example, a student noticed merely plugging numbers would not work. Therefore, this student had "[. . .] to analyze and understand real work applications and that would vary from the formulas." Another student noted that the course was already intuitive, but they did not learn new information and claimed, "[. . .] the course taught me many new applications of these topics that I'm glad I learned." Table 6 depicts the categories that emerged from open-ended responses from students in Case 1.

Table 6

Categories of Student Insights from Case 1

Category	**Definition**	**Number of students (N_1 = 4)**	**Example comment**
No change in learning strategy	Students did not change their learning strategy. They still employed the same strategy that they had been using.	3	"My strategies are the same as they were. Pay as much attention in class as possible and supplement with textbook or internet knowledge as needed."
Helpful instructional guidance	Students thought that the instructional guidance provided by the instructor was helpful. Guidance manifested through materials and projects was clear.	3	"The content in this course is fairly intuitive to me, but the instructor offers good explanations for less-intuitive concepts so his guidance is helpful."
Encourage analytical thinking	Students felt they gained analytical and problem-solving skills through the problems posed in the course. There was no particular simple way to solve the problems.	2	"[…,] there's not a preset list of equations to use nor the ability to just plug in values and get an answer. We have to analyze and understand real work applications and that would vary from the formulas."
New applications	One student noted that while they did not feel to learn new information, the course encouraged multiple applications of the	1	"Most of the content in this course is fairly intuitive to me and I was already familiar with a few of the topics, so it doesn't feel like I've

Category	Definition	Number of students (N_1 = 4)	Example comment
	topics.		learned much new information. However, the course taught me many new applications of these topics that I'm glad I learned."

Case 2

Three out of eight students in Case 2 noticed changes in learning strategies, employing different tactics when approaching a problem (e.g., creating visualizations in Excel to analyze information and solve a problem). One student said, "I find the visual relationship better to understand and have modified that to fit my calculus class as well [another quantitative class]."

Six students recognized the instructor selected and applied suitable instructional strategies, displaying awareness about the instructor's teaching and scaffolding strategies. They noted that the instructor promoted student-to-content engagement and provided strategic content sequence. One student expressed "[. . .] his [or instructor's] methodology of teaching builds new material on top of the previous material," insight that was not detected in Case 1.

Five students also noticed the transferable skills they gained, displaying a change in their HOTS. These students believed they could transfer what they learned into real-life situations, both personally and professionally. As one student noted, "The class is great for project management positions. [. . .] Even just knowing the basics is a great baseline for understanding economics that would come up in future workloads." Table 7 depicts common themes that emerged from open-ended responses by students in Case 2.

Table 7

Categories of Student Insights from Case 2

Category	Definition	Number of students (N_2 = 8)	Example comment
Change in learning strategy	Students realized they have changed their learning strategy such as by employing different approaches.	3	"I have found myself depending on excel to better understand this class. While a lot is based off just calculations, if you export the information to a table and populate it, I find the visual relationship better to understand and have modified that to fit my calculus class as well [which is another quantitative class]." "[. . . I] take different approaches when looking at a single problem."
Helpful instructional guidance	Students also attested about the helpful guidance provided during instructions. Materials and prompts were clear and helped increase engagement.	6	"He [the instructor] was extremely helpful and has adapted to student feedback which I feel has made this class easier to learn and more engaging." "[. . .] his methodology of teaching builds new material on top of the previous material."
Transferable skills	Students noted the transferable skills they have gained. These skills are either usable in personal life and/or future career.	5	"It is good information [. . .] that I can adapt to my own financials to a greater extent than my professional career." "The class is great for project management positions. Knowing how to research and create a proposal for a project seemed to be the focus of the class. Even just knowing the basics is a great baseline for understanding economics that would come up in future workloads." "I think the learning skills from this course allows me to stay prepared in the real world and not fall behind when presented with new information."

Discussion

We have conducted a formative evaluation on an LA implementation performed at a course level from the lens of SRL and HOTS. We used LMS usage data and an LA framework synthesized from existing literature. Results suggest an increase in effort regulation and critical thinking, but not in metacognition nor reflection in Case 2. Although

metacognition and reflection did not increase in Case 2, we detected a decrease in these variables in Case 1. In terms of student perception, we discovered positive insights in both cases. Students in Case 2 expressed their insights more analytically (e.g., why the instructor's guidance was helpful). They also noticed instructions were adjusted to match their learning experience (e.g., simpler topics were presented before more complex ones), indicating awareness about their own learning process and progress. We expound these results into several discussion points.

Robust Course Design as a Foundation

Students from Case 1 expressed positive perceptions about changes in their SRL and HOTS at the end of the semester, despite the absence of LA implementation. This may be due to course design and organization. For example, they noted that the course design incorporated instructional guidance. The students also thought learning tasks encouraged analytical thinking beyond simply inputting numbers into formulas. Both cases used similar course structures based on a QM course template developed by the university. Course content was segmented into modules that aligned learning outcomes to individual learning tasks and ordered by complexity. This suggests that well-designed instructional strategies and learning environments can be a foundation for enhancing student SRL and HOTS (Heong et al., 2011; Yen & Halili, 2015). Robust course design can therefore bootstrap effective LA implementation at the course level, allowing instructors to focus more on optimizing learning outcomes (Muljana et al., 2021; Muljana & Placencia, 2018). We intend to continue to practice robust course design in future course cohorts.

Ensuring the Mastery of Prerequisite Topics

Results suggest an increase in HOTS in the critical thinking domain among students in Case 2. This may have been influenced by initial content sequencing and instructional adjustments throughout the semester. Students must apply prior knowledge to adopt critical thinking (Pintrich et al., 1991), meaning instructors may consider ensuring students master prerequisite topics. In this context, the instructor used a mid-module quiz in each module to assess if students understood fundamental concepts. After reviewing quiz results, the instructor analyzed the quiz-item difficulty to determine which topics to review or provide remedial materials. According to existing literature, using LA enables instructors to analyze and diagnose students' current learning progress, struggles, and successes, thereby determining necessary interventions to help them achieve learning outcomes better (Casey & Azcona, 2017; Dietz-Uhler & Hurn, 2013; Macfadyen & Dawson, 2010). We will continue to use mid-module quizzes in the subsequent course cohorts to help instructor ensure mastery of prerequisite topics.

The Role of Early and Formative Diagnoses

Implementing LA may have increased effort regulation in Case 2. From early in the semester, the instructor checked how long students accessed course materials and whether they clicked course pages without reviewing material thoroughly. This data alerted the instructor to students who might have needed learning strategy tips to regulate their efforts in reviewing course materials in the LMS. Furthermore, students who accessed the course less periodically received an email reminding them to regularly access and review materials in the LMS. According to Kim et al. (2016) and You (2016), analyzing LMS usage data early in the semester can help instructors forecast students' course access habits (Kim et al., 2016; You, 2016).

Formative diagnosis in Case 2 may have additionally influenced students' SRL. Formative analysis of LMS data — e.g., student frequency and duration accessing course materials, students' timing (early or late) submitting assignments, and analyzing topic difficulty based on test report data — can support an instructor's decision regarding when to adjust learning conditions based on students' learning progress (Casey & Azcona, 2017; Dietz-Uhler & Hurn, 2013; Macfadyen & Dawson, 2010). In this context, the instructor continuously scaffolded students by adjusting instruction and providing remedial materials and reviews as needed. Consulting LA data throughout the learning process can help instructors find appropriate strategies to proactively help students perform better (Yen et al., 2015). As expected, students in Case 2 expressed their perception more analytically and in-depth, and were aware when instructors provided deliberate instructional guidance. This resonates with Winne's (2011, 2017) and Gašević et al.'s (2016) suggestions to highlight the important role of instructional guidance. Based on this finding, we will continue to implement analytical diagnoses and provide appropriate instructional guidance and conditions in future course cohorts.

Facilitating Metacognitive and Reflective Learning Activities

Metacognitive self-regulation did not change in Case 2, nor did LMS data appear to capture metacognitive learning activities. In a future course redesign, we plan to ask students to describe their learning habits and strategies during an ice-breaker discussion and explain how they overcome challenges while learning. This will provide the instructor an overview of students' awareness, knowledge, and control of their cognition before determining suitable instructional conditions to scaffold metacognition (Gašević et al., 2016; Winne, 2017).

Results suggested the reflective-thinking domain of HOTS did not improve, which may be due to the absence of a reflective assignment. While instructional strategies and a well-designed learning environment can promote HOTS (Heong et al., 2011; Yen & Halili, 2015), students need specific instructions to reflect upon their learning (Kember et al., 2000). We, therefore, plan to add a reflective assignment for the next course design iteration.

Future Work

Our findings highlight how LA may have influenced students' SRL and HOTS in two different course sessions. We recognize that the small number of participants makes it difficult to make a robust comparison or to examine for statistically significant differences on SRL or HOTS due to our LA implementation. Therefore, a future study may include a larger sample size and use an experimental design to investigate such impacts. We would also consider adding alternative data points, such as interviews or focus groups, to enrich our data sources and potentially reveal additional considerations when using LA to support SRL and HOTS.

The findings also give insight on iterative course design. We plan to redesign the course, adjust some assignments, and implement all three phases of LA such as: (1) early diagnosis at the start of the semester; (2) formative diagnosis throughout the semester; and (3) summative diagnosis conducted partly during and at the end of the semester (as shown in Table 1).

Because the practice of translating LA data into actionable interventions at the course level is still emerging (van Leeuwen, 2019), these findings suggest the potential of using LA to foster SRL and HOTS. We, therefore, encourage scholars, instructors, and instructional designers to test the LA framework synthesized from the existing literature for research and teaching purposes to expand the current body of literature at the intersection of LA, SRL, and HOTS.

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A Marie Kondō-Inspired Approach to Designing Accelerated Online Courses

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Accelerated courses offer the same learning outcomes and credit hours as their semester-length counterparts but over a shorter duration of study. At many universities, accelerated online courses are gaining traction as a solution to students' demand for more flexible scheduling. Many educators find it challenging to convert 16-week online courses to eight-week online courses. To help think through this conversion, we have been inspired by Marie Kondō's system for decluttering and tidying living and work spaces, only keeping items that are needed and spark joy. In this article we share our Marie Kondō-inspired approach to designing accelerated online courses.

Introduction

> *Imagine what it would be like to have a bookshelf filled only with books that you really love. Isn't that image spellbinding? ~ Marie Kondō*[1]

Our university has seen a rapid increase in the number of eight-week online course offerings to meet student demand for flexible scheduling. Accelerated courses, also referred to as intensive or compressed courses, are courses that take less time to complete than conventional semester- and trimester-length courses but provide the same credit and contact hours (Vlachopoulos et al., 2019). At our university, the most common duration for accelerated courses is eight weeks as opposed to the traditional 16-week offerings. These accelerated courses are typically offered during the summer term, but they are increasingly being added to the fall and spring semester-length terms as well. The reasonable approach for many faculty is to simply double the workload each week; for example, a project that would be scheduled across two weeks during a semester-length course will be scheduled to be completed in one week during an accelerated course. The contact hour calculations used by universities also seem to encourage this doubling up approach, and the aim to create equivalent experiences for students in both formats is a valid one. Learning theory, research, and student feedback, however, have shown that doing the exact same thing in half the time is not the best

approach to take (Holzweiss et al., 2019; McDonald et al., 2017). More direction in designing and delivering accelerated courses is necessary.

Our university is not alone in adding accelerated courses to its year-round offerings. Many universities see accelerated courses as a way to increase enrollment (Holzweiss et al., 2019). There is a growing demand for accelerated courses because of the perceived time efficiency; many students enrolled in accelerated courses and programs are juggling work and family commitments while completing their university education (Wlodkowski & Ginsberg, 2010).

The increased length of time spent together in a classroom each day in accelerated face-to-face courses offers students the ability to complete a course in a shorter time frame, focus on one course at a time, engage in a more immersive learning experience, and strengthen social connections among students and faculty (Herrmann & Berry, 2016; Lutes & Davies, 2018; Richardson et al., 2017). However, accelerated online courses present significant design and facilitation challenges, especially if the online courses rely on asynchronous learning, communication, and collaboration platforms and tools (Demmans Epp et al., 2017; Richardson et al., 2017).

Decluttering and Organizing Online Courses for Accelerated Delivery

> *Once you learn to choose your belongings properly, you will be left with only the amount that fits perfectly in the space you own. ~ Marie Kondō*

With the increased time spent working at home during the COVID-19 pandemic, many people tackled new projects. One project pursued was decluttering and reorganizing living spaces to better accommodate stay-at-home lives. Decluttering our homes so that entire families could live, go to school, and work comfortably in the same space became commonplace. Marie Kondō—an already well-known organizing consultant—became a household name during the pandemic as did her “Spark Joy” approach, and many were inspired by her videos, books, and television series to engage in significant reflection about their accumulated stuff and the role of their stuff in their lives.

There are a few basic tenets that make up the foundation of Marie Kondō’s KonMari Method (2014):

- Clear out the space and start from square one.
- Focus on categories of belongings (e.g., coats, books, mugs) instead of rooms (e.g., bedroom, kitchen).
- Choose only those belongings that spark joy, or have a clear function.
- Keep feelings of nostalgia at bay.
- Care for and respect your belongings.

Inspired by this advice, we adapted these five tenets to our accelerated online course re/design work—Alexis from an instructional designer’s point of view and Joni from the perspective of a faculty member developing an accelerated online course. We already embraced the recommendations of many practitioners regarding the design and facilitation of effective accelerated online courses, including (Brandt et al., 2015; Caskurlu et al., 2020; Colclasure et al., 2018; Kyndt et al., 2014; Lee & Horsfall, 2010; McDonald et al., 2017; Saxon & Martirosyan, 2017; Walsh et al., 2019):

- Ensuring content is necessary and directly relates to learning outcomes;
- Using of smaller formative assignments;
- Focusing on depth over breadth;
- Breaking large projects into smaller deliverables;
- Providing timely feedback;
- Providing opportunities for collaboration and group work;
- Providing clear expectations and prescriptive instructions and assessment tools;
- Using synchronous discussions instead of asynchronous discussions;
- Using video communications and materials instead of text-only; and
- Creating more active learning opportunities.

Along with these recommendations, we found Marie Kondō's prescription for decluttering and organizing a living space to be a practical and effective way of decluttering and reorganizing a course in preparation for an accelerated learning format. Plus, because of its familiarity, Marie Kondō's KonMari Method was a comfortable and easy-to-follow approach to the daunting task of redesigning the 16-week online course to work in the accelerated term. Throughout this article, we reference Joni and Alexis' redesign of Joni's online course on Creative Designs to describe our application of the KonMari Method in the early stages of course redesign for an accelerated online delivery.

Clear Out the Space and Start from Square One

> *It's easy to get rid of things when there is an obvious reason for doing so. It's much more difficult when there is no compelling reason. ~ Marie Kondō*

The main goal of the Creative Designs course redesign was to create an online course that worked equally well in both the accelerated eight-week summer session and the full 16-week fall semester in terms of students' learning experience and achievement of four learning objectives:

1. Embrace the creative side of instructional-materials design, and embrace the disposition of creative designers.
2. Design effective (i.e., inclusive, relevant, engaging, memorable) instructional materials for a chosen audience and in a chosen subject area
3. Apply research- and theory-based principles to the design of effective (i.e., inclusive, relevant, engaging, memorable) instructional materials.
4. Support design decisions with specific reference to principles, objectives, outcomes, and context.

Joni had been teaching the online Creative Designs course every fall and spring semester for more than seven years. She had revised the course several times to keep it up-to-date and aligned with student feedback and general continual improvement efforts at the program level; each year Joni made adjustments, changed assignments, and added resources. Most recently, the Creative Designs course had been divided into four parts over a 16-week semester:

- Weeks 1-5 (five weeks): Introduction to creative approaches; completion of creative design mini-projects on visual design, text design, drawing, and storytelling.
- Weeks 6-9 (four weeks): Presentation design project.
- Weeks 10-13 (four weeks): Infographic design project.
- Weeks 14-16 (three weeks): Reflection, revision, presenting, and celebration of course accomplishments.

When thinking about teaching the Creative Designs course during the accelerated summer term, Joni's initial idea was to keep the course content and sequence as it was and simply adjust the timeline. For example, instead of the Presentation and Infographic design projects each taking four weeks, her plan was to have each of those projects take only two weeks to complete. This approach was also going to make it relatively easy to prepare the online course in Canvas because it would only require a few edits and changes to the timeline. She quickly realized that this tactic was flawed because it assumed (a) the original course content and sequence was the gold standard for the course, and (b) it was instructionally reasonable to squeeze all of the existing content and assignments into a shorter timeframe and expect the same learning outcomes and positive student experience.

It can be easy to fall into the "gold standard" trap with a course that has been updated frequently and receives positive end-of-term evaluations. However, even well-received courses can become bloated over time as more content, materials, and resources are added without eliminating anything. Therefore, decluttering is a reasonable goal to have for long-standing courses. It's not that any of the content, activities, assignments, or resources (such as readings) is irrelevant; it's more likely that there is simply too much. And the effectiveness of decluttering is influenced by the organization of what remains. As Marie Kondō shares, "It's human nature to take the easy route, and most people leap at storage methods that promise quick and convenient ways to remove visible clutter. Putting things away creates the illusion that the clutter problem has been solved. But sooner or later, all the storage units are full, and the room once again overflows with things" (2014, p. 36-37). So, when decluttering a course, it is also important to reconsider storage.

Relating this idea to course redesign, it is important to step away from the learning management system (the storage unit) to resist leaping at a particular structure or layout (the storage method) for the course.

It can also be detrimental to students' learning and overall experience in an accelerated course if a course is not intentionally designed to work well in a shorter time frame (Holzweiss et al., 2019; Lee & Horsfall, 2010; McDonald et al., 2017). Accelerated courses are typically more intensive and require committed, uninterrupted time; going on vacation during an accelerated course, for example, is not recommended because even missing only a week is the equivalent of missing an eighth of the course. The intensiveness of an accelerated course can have some positive effects on student learning; when designed well and for the appropriate content and audience, the immersion into the content that takes place in accelerated courses can support students' learning (Lutes & Davies, 2018). However, there are also significant challenges associated with accelerated courses, especially for accelerated online courses (Holzweiss et al., 2019; Wlodkowski & Ginsberg, 2010). Important to the success of online courses, establishing social presence and building a safe and supportive learning community can be difficult to achieve with limited contact and time. It can also be challenging to design courses that involve students in feedback and revision cycles, such as composition, for an accelerated delivery (Colclasure et al., 2018; Collins et al., 2013). Finally, foundational undergraduate courses, such as General Biology, can be challenging to design for accelerated delivery because of the amount of required content that students must work with before they can move on and/or into the major (Brandt et al., 2015; Harwood et al., 2018).

The need to create a version of the Creative Designs course that worked equally well for students in both an eight-week and 16-week term and the need to examine the current content and assignments to update and improve students' learning experience in the course were compelling reasons to start from square one as Marie Kondō suggests. Instead of copying over the existing course shell in Canvas, Joni started with an empty course shell. And to avoid designing the course based on the inherent structure, flow, and layout of Canvas, she designed the new version of the course outside of Canvas before making decisions about how to structure the course within Canvas. Following Marie Kondō's advice —". . .tidying must start with discarding. We need to exercise self-control and resist storing our belongings until we have finished identifying what we really want and need to keep" (2014, p. 37) —Joni set aside thoughts of structure, flow, and layout and began the hard work of decluttering and discarding.

Focus on Categories of Belongings Instead of Rooms

> *The root of the problem lies in the fact that people often store the same type of item in more than one place. When we tidy each place separately, we fail to see that we're repeating the same work in many locations and become locked into a vicious circle of tidying. To avoid this, I recommend tidying by category. For example, instead of deciding that today you'll tidy a particular room, set goals like "clothes today, books tomorrow." ~ Marie Kondō*

Online courses that are delivered with the help of a learning management system such as Canvas help instructors efficiently set up the equivalent of rooms full of stuff (e.g., lectures, readings and other digital resources, assignments, quizzes, and projects). These rooms are established as modules, units, and/or weeks within a typical online course. This is how Joni's Creative Designs course was structured: weekly modules with guiding agendas and associated content and resources within each module. This means that the course's content on presentation design, for example, was spread out across multiple weeks and modules.

To follow Marie Kondō's advice, we defined the categories as the course's learning objectives. Instead of categories such as coats, shoes, and books, the course had four categories aligned to the course's learning objectives:

1. *Creative design*: Embrace the creative side of instructional-materials design; embrace the disposition of creative designers.
2. *Learner-centered inclusive design*: Design inclusive instructional materials for a chosen audience and in a chosen subject area.
3. *Informed design*: Apply research- and theory-based principles to the design of inclusive instructional materials.
4. *Design decision making*: Support design decisions with specific reference to principles, objectives, outcomes, and context.

A fifth category—*social presence and learning community*—was added because supporting the social context of learning and creating a supportive learning community were critical to Joni's online courses whether accelerated or not.

Next, Joni went through the entire course and created "piles" for each category. Below is an example of the "pile" for the *creative design* category. Joni pulled into one "pile" all of the resources, activities, and assignments associated with the *creative design* category (see Table 1). The items in this "pile" came from eight of the 16 weeks and from across two out of four modules.

Table 1

Original pile for the Creative Design category

	Resources	Activities & Assignments
Creativity	• Chip Heath & Dan Heath: Made to Stick, Introduction • Chip Heath & Dan Heath: Teaching that Sticks • Chip Heath & Dan Heath: The Power of Moments, Chapter 1 Defining Moments • Ira Glass: On Being Creative Genius (video approx. 2 minutes)-in Vialogues • Elizabeth Gilbert: Your Elusive Creative Genius (video approx. 20 minutes)-in Vialogues • Stefan Sagmeister's TED Talk on Happiness by Design	• Visual Design Challenge-in Slack (weekly) • Ideation Journals and Journaling • Soundtrack of Our Lives • Ideation Journal Revisited • Project: Gallery Show & Celebration
Visual design	• Introduction to Graphic Design - Design principles (basically CARP) (3:33 length video) • Robin Williams: The Non-Designers Design Book (4th edition), Chapters 1-7. • Ruth Colvin Clark & Chopeta Lyons: Graphics for Learning (2nd edition), Chapters 2 and 4. • Fair Use Checklist, Copyright Law for Instructional Designers, Finding Public Domain & Creative Commons Media	• Zoom session • Personal Logo • Design that Causes Lower Back Pain • You Belong in a Museum • Photos, Photos, Photos • Design Exploration Mini-Project: Visuals for Speech • Personal Logo Revisited
Storytelling	• Garr Reynolds: Why Storytelling Matters (video approx. 15 minutes)-in Vialogues • Garr Reynolds: Crafting the Story, Chapter 4 • Garr Reynolds: Using Images to Tell Stories, Chapter 4	• Zoom session • Design Exploration Mini-Project: Five Photo Story Part 1 • Design Exploration Mini-Project: Five Photo Story Part 1
Drawing	• TED Talk video as an example of how hand-drawing can help deliver an instructional message-in Vialogues • Scott McCloud: Making Comics, Intro & Chapter 1 (pp. 1-57) • Scott McCloud: Understanding Comics (video approx. 18 minutes)-in Vialogues • Dan Roam: Back of the Napkin, Chapters 2, 3, 8, 9, 10, 12, 13, 14 (pp. 13-45 & 147-234) • Dan Roam: Problem solving with simple pictures (video 6:18 min)-in Vialogues • The Boat (interactive graphic novel)	• Zoom session • Picasso Self-Portrait • Dinosaurs vs. Humans • Instruction by Fingerprint • Design Exploration Mini-Project: How to Make Toast Job Aid • Lessons Learned on the Back of a Napkin

Creating these piles for each category was eye-opening. The piles helped to illuminate what was valuable and important as well as where there were duplicates, gaps, inconsistencies, and inefficiencies. It was surprising to see what had ended up over time being over emphasized and what lacked the emphasis needed. And it was precisely what Joni needed to do before making any decisions about the course's redesigned structure and flow.

Choose Only Those Belongings that Spark Joy, or Have a Clear Function

> *Keep only those things that speak to your heart. Then take the plunge and discard all the rest. By doing this, you can reset your life and embark on a new lifestyle.*

To truly cherish the things that are important to you, you must first discard those that have outlived their purpose. ~ Marie Kondō

Often the act of decluttering a course or designing a course for an accelerated delivery is approached with apprehension because of concerns about having to eliminate valuable content and learning experiences (Lutes & Davies, 2018; Anastasi, 2007; Hyun et al., 2006; Kretovics et al., 2005); the lack of time for feedback, revision, and reflection; and the inability to give attention to social presence and community building (Colclasure et al., 2018; Ferguson & DeFelice, 2010; Karpicke & Roediger, 2007; Lutes & Davies, 2018; Sousa, 2017). Addressing this in terms of decluttering household belongings, Marie Kondō shares, "I had been so focused on what to discard, on attacking the unwanted obstacles around me, that I had forgotten to cherish the things that I loved, the things I wanted to keep" (2014, p. 57). This is a shift in thinking from fear of what will be lost to appreciation for what is intentionally kept. The KonMari Method encourages us to have gratitude for what we discard, giving us closure to our relationship with what we discard in order to make it easier to let it go and focus on the value of what we keep. As Marie Kondō states, "We should be choosing what we want to keep, not what we want to get rid of" (2014, p. 57). This mindset is helpful when decluttering a course and/or designing an accelerated course because initially everything—all content, activities, projects, and resources—seem of critical value. It can be hard to let go.

In the spirit of picking "up each book, one by one" to determine if it sparked joy or was functional, Joni considered each item in each of the piles (based on the five categories), and reexamined its relevance given the learning objectives and the social presence/learning community instructional goal. For example, for the *creative design* category—which includes four unique components: creativity, visual design, storytelling, and drawing—Joni reviewed each reading and video to have a fresh perspective on its contribution to student learning. She also reread the instructions and assessment tools for each activity and assignment. This led to her discarding a number of items from the pile and noting where there were obvious gaps, as reflected in Table 2 below:

- For creativity, several readings and videos were discarded, one video was moved to be used during a Zoom session instead of reviewed independently, and three activities/assignments were reviewed. For example, although Joni believed that ideation journaling was a valuable activity, students never seemed to warm to it as part of their practice which made the assignment feel like busy work. Also, Joni realized she had an activity she felt was quite impactful—a weekly visual design challenge—that she had not previously prioritized because there were many other activities that received more attention. This decluttering process helped Joni see the lost opportunity and recommit to it as a valued activity. Finally, Joni realized that she wanted to include an activity that encouraged students to reflect on their hobbies and explore how the creativity involved in pursuing their hobbies was relevant to learning/instructional design; she wanted to have an activity that would activate students' prior learning about creative design and their preexisting creative spirit and know-how.
- For visual design, one video was discarded, one activity was discarded, and one activity was realigned to be used during a Zoom session instead of completed independently. Also, because learner-centered design—including inclusive design and universal design for learning (UDL)—is such an important part of the course, it was glaring to see that there was no mention of it in the pile. Therefore Joni made note of the need to address the gap, a gap she did not see before and likely would have missed if she had approached the redesign of the course within Canvas. Joni definitely found the following advice from Marie Kondō to be true: "The best way to find out what we really need is to get rid of what we don't" (2014, p. 218).
- For storytelling, Joni noted a gap in the storytelling literature related to creative design of instructional materials so made note of the need to address the gap in the resources provided to students.
- For drawing, the Marie Kondō-inspired approach led to several adjustments. For example, instead of requiring students to both watch a presentation and read a set of chapters on making comics, Joni made note that since they cover the same ideas that students could choose one or the other. Another video was discarded in favor of a more detailed reading, and another video was moved to be part of a Zoom session instead of being completed independently. Finally, three activities/assignments were discarded, and Joni noted a gap that required a new activity on comic creation.

Table 2

Decluttered pile for the *Creative Design* category

	Resources	Activities & Assignments
Creativity	• Chip Heath & Dan Heath: Made to Stick, Introduction • Chip Heath & Dan Heath: Teaching that Sticks • Chip Heath & Dan Heath: The Power of Moments, Chapter 1 Defining Moments • Ira Glass: On Being Creative Genius (video approx. 2 minutes)-in Vialogues MOVE: To Zoom session activity • Elizabeth Gilbert: Your Elusive Creative Genius (video approx. 20 minutes)-in Vialogues • Stefan Sagmeister's TED Talk on Happiness by Design	• Zoom session, include Ira Glass: On Being Creative Genius (video approx. 2 minutes) • Visual Design Challenge-in Slack (weekly) • GAP: Reflection on Hobbies • Ideation Journals and Journaling • Soundtrack of Our Lives • Ideation Journal Revisited • Project: Gallery Show & Celebration
Visual design	• Introduction to Graphic Design - Design principles (basically CARP) (3:33 length video) • Robin Williams: The Non-Designers Design Book (4th edition), Chapters 1-7. • Ruth Colvin Clark & Chopeta Lyons: Graphics for Learning (2nd edition), Chapters 2 and 4. • Fair Use Checklist, Copyright Law for Instructional Designers, Finding Public Domain & Creative Commons Media • GAP: Learner-centered Design: Inclusive Design, University Design for Learning (UDL)	• Zoom session, include Photos, Photos, Photos • Personal Logo • Design that Causes Lower Back Pain • You Belong in a Museum • Photos, Photos, Photos MOVE to Zoom session activity • Design Exploration Mini-Project: Visuals for Speech • Personal Logo Revisited
Storytelling	• Garr Reynolds: Why Storytelling Matters (video approx. 15 minutes)-in Vialogues • Garr Reynolds: Crafting the Story, Chapter 4 • Garr Reynolds: Using Images to Tell Stories, Chapter 4 • GAP: Duarte on storytelling	• Zoom session • Design Exploration Mini-Project: Five Photo Story Part 1 • Design Exploration Mini-Project: Five Photo Story Part 1
Drawing	• TED Talk video as an example of how hand-drawing can help deliver an instructional message-in Vialogues MOVE to Zoom session activity • Scott McCloud: Making Comics, Intro & Chapter 1 (pp. 1-57) • --OR, student choice-- • Scott McCloud: Understanding Comics (video approx. 18 minutes)-in Vialogues • Dan Roam: Back of the Napkin, Chapters 2, 3, 8, 9, 10, 12, 13, 14 (pp. 13-45 & 147-234) • Dan Roam: Problem solving with simple pictures (video 6:18 min)-in Vialogues • The Boat (interactive graphic novel)	• Zoom session, include TED Talk video as an example of how hand-drawing can help deliver an instructional message • GAP: Comic creation activity • Picasso Self-Portrait • Dinosaurs vs. Humans • Instruction by Fingerprint • Design Exploration Mini-Project: How to Make Toast Job Aid • Lessons Learned on the Back of a Napkin

Joni approached the *learner-centered inclusive design*, *informed design*, and *design decision making* piles in the same way. However, when she began working on the *social presence and learning community* pile, Alexis reminded her that the items in this pile needed to both spark joy and be functional in the accelerated version of her online course; in other words, the activities needed to serve her instructional goal of creating a supportive learning community and also further student learning related to one or more of the learning objectives. Because she values social presence and community building so much in her online courses, Joni had several activities in the original course primarily designed to bridge the transactional distance and minimize the associated isolation that can happen in online courses, help the class get to know each other in preparation for collaboration, and develop a professionally-respectful connection that would allow them to feel safe sharing their work for peer critique. However, in an accelerated time frame, there would not be time for those social presence-focused activities unless they also were included in one of the other decluttered piles. For example, after a first pass of decluttering the *creative design* pile Joni had eliminated the *Dinosaurs vs. Humans* activity. But because this activity was also in the *social presence and learning community* pile, Joni reinstated it because it served two purposes in the course: the activity reinforced student drawing and was a playful, less stressful way to share and critique each other's work. From that point forward, Joni eliminated all s*ocial presence and learning*

community items from the pile unless they also supported one or more of the course's learning objectives. To help her reflect this in each of the piles, Joni underlined activities and assignments that addressed s*ocial presence and learning community* interests as well (see Table 3).

Table 3

Decluttered pile for the *Creative Design* category with *Social Presence and Community Building* items underlined

	Resources	Activities & Assignments
Creativity	• Chip Heath & Dan Heath: Made to Stick, Introduction • Chip Heath & Dan Heath: Teaching that Sticks • Chip Heath & Dan Heath: The Power of Moments, Chapter 1 Defining Moments • Ira Glass: On Being Creative Genius (video approx. 2 minutes)-in Vialogues MOVE: To Zoom session • Elizabeth Gilbert: Your Elusive Creative Genius (video approx. 20 minutes)-in Vialogues • Stefan Sagmeister's TED Talk on Happiness by Design	• Zoom session, include Ira Glass: On Being Creative Genius (video approx. 2 minutes) • Visual Design Challenge-in Slack (weekly) • GAP: Reflection on Hobbies • Ideation Journals and Journaling • Soundtrack of Our Lives • Ideation Journal Revisited • Project: Gallery Show & Celebration
Visual design	• Introduction to Graphic Design - Design principles (basically CARP) (3:33 length video) • Robin Williams: The Non-Designers Design Book (4th edition), Chapters 1-7. • Ruth Colvin Clark & Chopeta Lyons: Graphics for Learning (2nd edition), Chapters 2 and 4. • Fair Use Checklist, Copyright Law for Instructional Designers, Finding Public Domain & Creative Commons Media • GAP: Learner-centered Design: Inclusive Design, University Design for Learning (UDL)	• Zoom session, include Photos, Photos, Photos • Personal Logo • Design that Causes Lower Back Pain • You Belong in a Museum • Photos, Photos, Photos MOVE: To Zoom session • Design Exploration Mini-Project: Visuals for Speech • Personal Logo Revisited
Storytelling	• Garr Reynolds: Why Storytelling Matters (video approx. 15 minutes)-in Vialogues • Garr Reynolds: Crafting the Story, Chapter 4 • Garr Reynolds: Using Images to Tell Stories, Chapter 4 • GAP: Duarte on storytelling	• Zoom session • Design Exploration Mini-Project: Five Photo Story Part 1 • Design Exploration Mini-Project: Five Photo Story Part 1
Drawing	• TED Talk video as an example of how hand-drawing can help deliver an instructional message-in Vialogues MOVE: To Zoom session • Scott McCloud: Making Comics, Intro & Chapter 1 (pp. 1-57) • --Student choice, either/or-- • Scott McCloud: Understanding Comics (video approx. 18 minutes)-in Vialogues • Dan Roam: Back of the Napkin, Chapters 2, 3, 8, 9, 10, 12, 13, 14 (pp. 13-45 & 147-234) • Dan Roam: Problem solving with simple pictures (video 6:18 min)-in Vialogues • The Boat (interactive graphic novel)	• Zoom session, include TED Talk video as an example of how hand-drawing can help deliver an instructional message • GAP: Comic creation activity • Picasso Self-Portrait • Dinosaurs vs. Humans • Instruction by Fingerprint • Design Exploration Mini-Project: How to Make Toast Job Aid • Lessons Learned on the Back of a Napkin

Keep Feelings of Nostalgia at Bay

> *When you come across something that you cannot part with, think carefully about its true purpose in your life. You'll be surprised at how many of the things you possess have already fulfilled their role.*
>
> *By handling each sentimental item and deciding what to discard, you process your past. If you just stow these things away in a drawer or cardboard box, before you realise it, your past will become a weight that holds you back and keeps you from living in the here and now. ~ Marie Kondō*

One of the most significant challenges of decluttering is when sentimentality clouds whether or not an item truly sparks joy and/or is functional. For example, some people find it hard to part with items that represent important past events and experiences such as a high school basketball jersey, an unread book gifted by a good friend, or a notebook full of worked math equations completed while in middle school. These items don't quite spark joy and they certainly no longer serve a functional purpose, yet the nostalgia associated with them can often lead to them being stowed away until the next decluttering effort. For items that are hard to let go of Marie Kondō offers this valuable advice:

> *During the selection process, if you come across something that does not spark joy but that you just can't bring yourself to throw away, stop a moment and ask yourself, "Am I having trouble getting rid of this because of an attachment to the past or because of a fear for the future?" Ask this for every one of these items. As you do so, you'll begin to see a pattern in your ownership of things, a pattern that falls into one of three categories: attachment to the past, desire for stability in the future, or a combination of both. It's important to understand your ownership pattern because it is an expression of the values that guide your life.*

Nostalgia and sentimentality can also play a role in course redesign. Some resources, content, activities, and assignments can be difficult to set aside because historically they served a purpose in the course. When Joni was decluttering the Creative Designs course there were a number of resources and activities that were hard to part with because she enjoyed their playful characteristics. For example, although the *Soundtrack of Our Lives* and *You Belong in a Museum* activities that were part of the Creative Design pile reinforced specific concepts, their primary role in the course was fun and play. Although she recognized that the redundancy with other activities was unnecessary, it was hard for Joni to remove these activities from the course because of her fond memories of students' great contributions. Another example was Joni's decision to let go of a set of readings from Heath & Heath's *Made to Stick* book. These readings had served a clear purpose in the past, but the course's focus and learning objectives had changed over time and they were no longer in alignment. It was hard for Joni to let go of these readings because she loved them so much, but they no longer served a clear purpose for students.

Following Marie Kondō's advice, Alexis encouraged Joni to review each of the "hard to let go of" items in the Creative Designs course and ask herself why she was having trouble letting it go. This allowed Joni an opportunity to go back to the course's learning objectives and review what else was in the *creative design* pile to reassure herself that the items were really unnecessary and were in fact taking up space that she needed for other items that aligned with the learning objectives. Because Alexis had no emotional attachment to the course activities in the same way that Joni did, she was able to provide an outside perspective that focused more on learning objectives rather than sentimentality. This is one of the assets an instructional designer provides: by asking key questions, they can help get to the heart of what's relevant and meaningful in terms of a course's learning objectives.

Care for and Respect Your Belongings

All you need to do is take the time to sit down and examine each item you own, decide whether you want to keep or discard it, and then choose where to put what you keep.

The essence of effective storage is this: designate a spot for every last thing you own.

Storage, after all, is the sacred act of finding a home for your belongings. ~ Marie Kondō

After decluttering all of the piles it is time to organize them and put them in their place. To this end Marie Kondō provides much advice on how to organize and store household belongings. For example:

> *The most basic rule is to hang clothes in the same category side by side, dividing your closet into a jacket section, a suit section, and so on. Clothes, like people, can relax more freely when in the company of others who are very similar in type, and therefore organizing them by category helps them feel more comfortable and secure.*

The process of organizing and storing is just as important as the decluttering process because the aim is to create a structure and space that makes it easy for you to locate, use, and enjoy the items you possess. Ultimately, if the KonMari Method is embraced and diligently followed, people can experience a shift in their mindset about their belongings and limit the need to engage in major decluttering and reorganization in the future.

This is the same for setting up an online course in a learning management system such as Canvas, Schoology, or Slack—it is time to organize all of the items from the decluttered piles to create a structure and space that makes it easy for students to locate, use, and learn from and with the course content, resources, activities, and assignments. We found it very helpful to work together on this because Alexis is well-versed in instructional strategies and technologies to support student learning and engagement in online and accelerated online courses. In collaboration, we went through the decluttered piles and discussed various ways to physically structure the course in Canvas; how to incorporate additional platforms such as Slack in support of student learning, communication, and collaboration; and how to organize everything for ease of access and use. As Marie Kondō shares, "Once you have an image of what the inside of your drawers will look like, you can begin folding." Alexis helped Joni get an image of what the course could look like so she could begin folding, hanging, and tidying up all of the course content in its proper place.

Marie Kondō is also known for promoting a specific way of folding clothes not only for better organization but also to encourage appreciation of the clothing: "The act of folding is far more than making clothes compact for storage. It is an act of caring, an expression of love and appreciation for the way these clothes support your lifestyle. Therefore, when we fold, we should put our heart into it, thanking our clothes for protecting our bodies" (2014, p. 93). We were inspired by this approach to preparing items for storage and, therefore, applied it to the redesign of the Creative Designs course. This required Joni to revisit each existing activity and assignment and rewrite the introduction and instructions for clarity and completeness. She also made note of any needed modifications to support materials. Finally, she outlined how she wanted the activity or assignment to be presented to students, including what tool or functionality was needed and the look-and-feel of the physical space in Canvas. It was only after all of this had been completed with Alexis' support that Joni began building the decluttered, reorganized course in Canvas.

Conclusion

> *People cannot change their habits without first changing their way of thinking. ~ Marie Kondō*

Joni taught the redesigned accelerated version of the Creative Designs online course in Summer 2021 to a group of 22 students with very positive results. Via the end-of-course evaluation, students gave her 5 out of 5 for her effectiveness as an instructor and gave the course 5 out of 5 for the effectiveness of the course as a learning experience. Although the end-of-course evaluation does not include specific questions about course structure, students shared:

> *The course was well-organized, and for each assignment, the instructions were thorough and very helpful in understanding what was expected.*

> *The whole organization of the course was fantastic! I enjoyed all the assignments and the way they were broken down, the Zoom meet ups were helpful and the way we utilized other students was also well orchestrated.*

> *I believe that the way the Joni has the course set up and the projects and her teaching strategies were a great way to learn creative thinking and graphic design.*

Students also shared their perspective of the learning experience which helped to reinforce Joni's own sense of the course as effective in the accelerated online format:

> *Joni's teaching techniques are amazing. Honestly at the beginning of some assignments I would think "Why are we doing this?" and by the end I always had 'aha' moments, seeing great value in everything that we did. My design skills were upgraded several levels.*

I appreciate Joni's flexibility, willingness to adjust assignments to personal needs, always providing frequent, timely, and meaningful feedback, and building a sense of community with synchronous learning opportunities.

Your flexibility during this accelerated course was much appreciated!

Joni was very supportive and provided good feedback to help me grow as a learner.

With one course left in the program, I am super sad that I won't have Joni as an instructor anymore. She has been my favorite teacher in the program and I have gained so much from the three courses I've taken with her. I truly aim to model many of my practices after her style. Thank you so much Joni!!!

The effectiveness of the accelerated version of the course has led to valuable adjustments to the 16-week version of the course as well. Joni did not want there to be two distinct versions, so she used the redesigned accelerated version as the template for the 16-week version. She intentionally continued with the Marie Kondō-inspired structure and decluttered content, avoiding the temptation to add more content and activities in response to having double the time. The new-and-improved Creative Designs online course works well in the 16-week format because the elimination of clutter and the associated restructuring means that students can take two courses in the 16-week term and continue with their full-time employment and other responsibilities; the bloated version of the course made it much more challenging for students to pursue the typical two-courses-per-semester schedule.

Although only midway through the semester, Joni has already found that the students are more interactive and more deeply engaged in the work and with each other than has been her experience in the last couple of years. In addition, she is enjoying the course more than she had been and believes her re-ignited enthusiasm for the course is reflected in her engagement with students. After teaching the same course for so long, Joni was no longer as excited to teach the course as she had once been. So Joni's renewed interest in and recommitment to the course has been an unexpected benefit of completing the Marie Kondō-inspired redesign. Joni plans to continue to monitor students' experiences in both the accelerated and 16-week versions of the course to ensure equitable opportunities and outcomes for students regardless of course timeframe.

COVID-19 caused us all to rethink the physical spaces we lived and worked in. Reorganizing and decluttering our online courses followed. The thought of cutting out content that you have spent valuable time cultivating is never an easy task. To many educators, it indeed feels like a loss. But remember, students are not going to miss what they did not know existed. By focusing on ensuring every item and activity in your course serves a meaningful purpose (ideally multiple purposes), students are getting an elevated learning experience that truly focuses on what you want them to achieve.

This shift from thinking of a course as a set of individual tasks to holistic outcomes requires a huge change in mindset. Similar to how decluttering your home does not work by focusing on one room at time, decluttering your course does not work by cutting or condensing one activity at a time. This requires a full and complete redesign of a course—something that cannot be accomplished overnight. In fact, Marie Kondō suggests decluttering your home takes about six months. Your course redesign may take the same.

The benefits are well worth the time. Students are less likely to be overwhelmed, and they are more likely to be motivated because of the clear purpose behind each activity. Also, do not be surprised if redesigning your accelerated course has a positive effect on multiple courses. Once you have experienced the joy of reorganizing and tidying-up, the effect is contagious. Once we simplify what is in front of us, all things seem possible.

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Say What? Learner Reactions to Unexpected Agent Dialogue Moves

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Intelligent Tutoring | Eye-tracking | Agent-based Instruction

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For maximally efficient and effective conversation-based intelligent tutoring systems, designers must understand the expectations carried by their intended learners. Strategies programmed into the agents may be interpreted differently by the learners. For example, conversational heuristics in these systems may be biased against false alarms in identifying wrong answers (potentially accepting more incorrect answers), or they may avoid directly answering learner-generated questions in an attempt to encourage more open-ended input. Regardless of pedagogical merit, the learner may view these agents' dialogue moves as bugs rather than features and respond by disengaging or distrusting future interactions. We test this effect by orchestrating situations in agent-based instruction of electrical engineering topics (through an intelligent tutoring system called AutoTutor) where the pedagogical agent behaves in ways likely counter to learner expectations. To better understand the learning experience of the user, we then measure learner response via think-aloud protocol, eye-tracking, and direct interview. We find that, with few exceptions, learners do not reason that the actions are meant as instructional or technical strategies, but instead broadly understood as errors. This indicates a need for either alteration of agent dialogue strategies, or else additional (implicit or explicit) introduction of the strategies to productively shape learners' interactions with the system.

Introduction

In intelligent learning technology, the effectiveness of pedagogical interventions rests in part on establishing and leveraging learners' trust that the interventions are appropriate. As such, unexpected actions may be met with critical thinking, skepticism, confusion, or outright dismissal. Some of these outcomes may prove desirable—others disastrous. Natural language paradigms present additional challenges, with questions open to interpretation, answers defying singular expression, and opportunities for confusion at both the system and learner ends. Intelligent agents are one application of natural language instructional tools that can promote engagement and deep learning (Graesser et al., 2003). This paper explores some challenges a designer may confront related to effectiveness versus the substantial

cost of natural language processing (NLP) interventions, with an emphasis on the learning experience as the focal point of design decisions (Tawfik, 2021).

The impact of conversation-based intelligent tutoring systems (ITS) on student learning has been subject to numerous and varied investigations. Researchers have explored the physical design of pedagogical agents to examine the difference between animated and human-like agents (Moreno et al., 2001), the embodiment of agents through the use of gestures, facial expressions, and eye movement (Li et al., 2019; Louwerse et al., 2009; Lusk & Atkinson, 2007), and the role of the agent's gender (Krämer et al., 2016). Others have focused on attributes ranging from voice quality (Craig & Schroeder, 2017) to personalization through levels of politeness (Wang et al., 2008) and rapport-building efforts (Krämer et al., 2016). These studies have expanded the knowledge base through specific guidelines for designing aesthetic and identity aspects of the artificial agents themselves.

As research and practice move deeper into dialogue spaces shared by agent and learner, investigation correspondingly expands into conditions that transcend the superficial aspects of design. The conversational actions of the agent—or dialogue moves—may impact the learner directly through metacognitive prompting (McCarthy et al., 2018; Wu & Looi, 2012) and indirectly through confusion (Lehman et al., 2012; Lehman et al., 2013). Lehman et al. (2013) ascribed confusion to "contradiction, anomaly, or system breakdown" engendered by the agent for the purposes of triggering cognitive disequilibrium within the learner (p. 86). Learners presented with agent-induced confusion did, indeed, show improved learning, prompted by the need to resolve that cognitive disequilibrium and create an internal model of the world that matches the information provided. However, that confusion in the learning environment must be appropriately regulated to produce learning gains, and these regulations still require examination and cataloging (Lehman et al., 2012).

Meaningful learning in the face of deliberate confusion may be tempered by a learner's inherent trust in artificial intelligence. Pedagogical agents in learning environments are designed to provide a social presence to positively affect learning either as an emulation of a teacher or a co-learner (Chae et al., 2016; Lee et al., 2007). Researchers have studied determinants of learners' perception of trust of the agents, including the physical appearance of (Burgoon et al., 2016; Chae et al., 2016), emotional connection to (Savin-Baden et al., 2015), and the perception of caring from (Lee et al., 2007) the agent. The trust emanating from these factors appears to have a causal impact on learner participation intention, disclosure of information, and learning, respectively. Though these findings shape our understanding of how trust impacts communication and learning, they do not bear directly on pedagogical technique. A complex interaction of expected linguistic proficiency, perceived agent intention, and learner understanding of pedagogical technique likely has a significant impact on how contradictory or confusing agent dialogue moves impact perceptions of trust. Simply put, whether or not the learner knows what the agent is doing likely has an impact on communication patterns and subsequent learning outcomes, as much or more so than merely cosmetic agent characteristics. However, that interaction is not well understood.

AutoTutor

AutoTutor and its family of related systems (e.g., Graesser, 2016; Nye et al., 2014) provide an invaluable test bed for this inquiry. In this conversational intelligent tutoring system, (typically) adult learners encounter one or more talking head agents that present conceptual questions. The agents play the role of a tutor agent or a peer agent, often with both roles presented to afford complex interaction dynamics. Referring to a visual aid (e.g., a circuit diagram for electrical engineering problems), the agent(s) introduces a concept and then asks a question about it that requires multipart answers. The diagram contains hotspot-enabled "Point & Query" interaction for common questions (Graesser et al., 2018). For example, hovering over a critical component would trigger the appearance of questions like "What is this component?" and "What does this component do?", each of which containing a secondary hotspot with an answer. After the AutoTutor main question appears, learners attempt to answer via typed natural language input, interacting with and disengaging from the Point & Query as needed.

AutoTutor analyzes learner input on several factors. Based on a complete and correct answer provided and validated by several domain experts, the system extracts knowledge components that form discrete parts of the complete answer.

Each knowledge component is processed for conceptually linked alternative articulations via latent semantic analysis and given a degree of leeway in spelling and colloquialism via regular expressions. This expanded and flexible version of a systematically segmented answer forms the basis for comparison. If the learner provides a complete and correct answer (i.e., one that rests above a critical threshold based on latent semantic analysis and regular expression similarity to the ideal answer), the agents will acknowledge that with positive feedback, summarize the key points, and invite the learner to move on to another question. If the learner provides only part of a correct answer, the agents will encourage additional information or reasoning via one of three techniques. A hint will introduce a key concept that the learner omitted (e.g., “But what will happen to the voltage?”). A prompt encourages the inclusion of a single key content word from a missing knowledge component (e.g., “Increasing the resistance will decrease what?”). Finally, a pump provides generic encouragement to add more information (e.g., “Can you tell me anything else about it?”).

In combination, these AutoTutor responses handle a variety of learner input and can create a relatively detailed assessment of the learner’s understanding. It constitutes a “diagnostic” interactive learning resource based on its ability to discern conceptual understanding at gradient levels (i.e., requiring support to provide a full answer versus offering all parts on initial inquiry) (Hampton, 2019). This general approach has demonstrated learning gains in a wide range of fields (Nye et al., 2014), including reading comprehension and physics.

However, each of the interventions detailed above requires a degree of confidence in understanding unconstrained learner input. Absent perfect comprehension, imperfect heuristics must guide system response in the presence of heightened uncertainty. As far as possible, these heuristics should align with pedagogical goals. We next highlight several such heuristics that may be deployed in the event of uncertainty, that we categorize as edge cases.

Edge Cases

Acceptable Faults

As noted, the criteria for differentiating correct from incorrect input is mathematical. However, this discrete threshold masks a fuzzy distinction that questions when the system should act to resolve an incorrect answer. Following from statistics principles laid out by Neyman and Pearson (1967), there exist four possible outcomes in deciding whether or not to deploy corrective feedback: the answer is correct and the system judges it as correct (correct rejection); the answer is wrong and the system judges it as wrong (hit); the answer is wrong but the system judges it as correct (miss); and the answer is correct by the system judges it as wrong (false alarm). Total proportions of hits and false alarms derive from accuracy of classification mechanisms within a system.

Beyond those limits, designers must choose whether false alarms or misses are the preferred outcome. Any threshold decision necessarily implies a value assignment between the two outcomes. Is it worse to be wrong and be told you are right, or to be right and told you are wrong? In AutoTutor, a relatively low threshold argues that the latter constitutes the worse outcome. Learner-generated answers that may be right (but probably are not) will be treated as right. AutoTutor avoids perpetuating misconceptions by reviewing the correct answer immediately after providing positive feedback. The low threshold value argues that this situation represents an acceptable fault relative to the alternative. In that alternative, a learner provides the right answer only to have the system provide corrective feedback, followed by a summary in which her original answer appears in paraphrase. This may well inspire unproductive confusion or, worse, distrust and disengagement that precludes further study. The heuristic, then, boils down to giving the learner the benefit of the doubt.

Question Rerouting

The trialogue paradigm that uses both tutor and peer agent may inspire a looser conversational dynamic than other natural language ITS approaches. As such, learners may feel inclined to pose their own questions for clarification or background. These questions likely reflect good-faith attempts to answer the main question. However, direct responses may prove suboptimal for several reasons. First, answering questions is technically demanding. Interrogatives entail different sentence structure comprehension to accurately parse and different response patterns to reply fluidly. Further, the open input mechanism does not integrate a marker to indicate the difference a priori, requiring a purpose-built

function to identify interrogatives before parsing and responding. Though learners posing questions is certainly a possibility, it is not common practice in the conversational ITS paradigm. Therefore, these complex programming demands are unlikely to prove cost effective.

Second, the Point & Query system integrated into the visual aid should make learner-generated interrogatives largely redundant. The presence of that referential information should preclude more basic questions, as the system largely anticipates what those would be and makes the answers readily available. Third, pedagogically, the existing conversational and diagrammatic interface is designed to provide all the information necessary to answer the question except for what must be provided by the learner. Any information or clarification provided only serves to confound evaluations that will inform the learner model and determine downstream learning activity.

Following these arguments, AutoTutor does not directly respond to learner questions. Instead, it parses questions the same as answers. Likely the questions include relevant content words but lack relational language that would rise above the threshold of correctness. As such, interrogatives would generally trigger responses similar to partially correct answers. These responses include hints, prompts, and pumps intended to encourage more complete answers, targeting specific knowledge components as deemed necessary. Essentially, the system answers learner questions with questions. This strategy fits well within the overall pedagogical approach. However, it does not account for how the learner interprets a non-answer to their direct question. Understanding how learners interpret these two heuristics will inform our understanding of the learner–system dynamic more generally and provide insight on how best to design conversational interactions for optimal learner outcomes.

Method

To better understand this dynamic, we orchestrated situations within a learning platform focused on electrical engineering topics with participants from our target learner demographic. By controlling the starting point and providing only general instructions rather than specific phrasing to be input, we balance the need for realistic testing circumstances and active engagement with the benefits of reasonable comparison across participants. An array of measures for learner response (think-aloud protocol, eye-tracking, and direct interview) attempted to gather as much meaningful information as possible.

Participants

We recruited participants from the electrical and computer engineering department of a large university in the Midsouth region of the United States. Participants had to have completed at least one course in electrical engineering to register. A total of nine students participated, of whom we eliminated two: one due to communication issues stemming from speaking English as a second language, and the second due to corruption of the audio file. This left seven participants. Though this constitutes a small *n*, we conceive of this inquiry primarily in terms of user experience optimization. In that experimental paradigm, as few as five participants may be considered sufficient to uncover a strong majority of exigent design deficiencies (Nielsen & Loranger, 2006).

Materials

Participants interacted with a federated learning system consisting of several constituent learning resources. These included both intelligent and conventional materials, with adaptivity varying in type and degree across resources. The system, ElectronixTutor (Graesser et al., 2018; Hampton & Graesser, 2019), uses a single interface to present all resources. Of these resources, AutoTutor figures prominently and constituted the largest portion of testing. All learning content focused on electricity and electronics topics common to undergraduate university or basic military education in the area, derived primarily from the curriculum set forth in the Navy Electricity and Electronics Training Series (U.S. Navy, 1998). The Tobii Eye Tracking system provided unobtrusive attentional measurement as well as voice recording. Interview questions delivered throughout the study by a member of the research team (in person) supplemented these data.

Procedure

Participants received a brief overview of the ElectronixTutor system, its purpose, intended use, and basic structure (i.e., a federated collection of learning systems). Following eye-tracking explanation and calibration, the participants received a list of tasks to complete in ElectronixTutor, and instructions to narrate their perceptions and thought process via think-aloud protocol. Research assistants instructed participants to navigate to specific functions corresponding to tasks in line with the intended classroom integration and independent study usage. Each instruction came with a brief scenario description to guide their usage. Total time for individual participants ranged from 30 minutes to one hour. After initial navigational tasks (e.g., find the home page), participants were presented with an AutoTutor problem and progressed through it normally. Next, the researchers presented a second problem and instructed the participants to provide a designated incorrect answer in their own words. Specifically, the question asked for the relationship between total current of a circuit and three branch currents. The correct answer is that the branch currents add up to the total current, but in the scenario, participants were instructed that they believed the relationship was multiplicative. That answer may or may not have met the criteria for correctness depending on how participants phrased it. This manipulation created the first possibility for confusion, corresponding to the 'Acceptable Faults' heuristic. Participants were then instructed to pose questions to the system about the main question. This manipulation created the second possibility for confusion, corresponding to the 'Question Rerouting' heuristic. Participants then proceeded through other stages relevant to the broader evaluation of ElectronixTutor, but not to the current study. Each stage entailed its own follow-up interview questions administered by a member of the research team in person.

Data Analysis

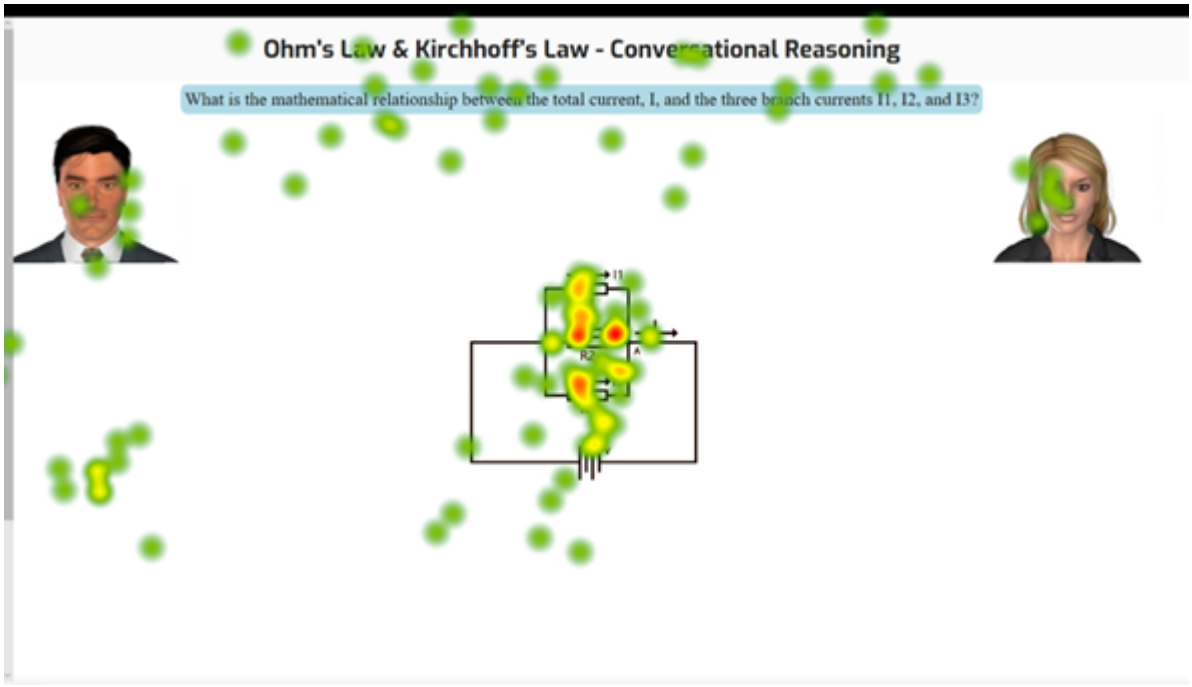
Following the study period, two graduate research assistants transcribed all audio recordings. Transcripts were then organized into idea units (Weinberger & Fischer, 2006). These idea units had break points when (1) the participants spoke about an interaction with the interface (2) the participants spoke about a learning interaction with a tutor or multiple-choice questions, or (3) participants completed a task. Approximate time codes supplement the transcript data.

Results & Discussion

The seven participants demonstrated relatively stable patterns across the three critical tasks. In the unconstrained AutoTutor interaction (i.e., when they provided good-faith attempts to answer questions), we see patterns exemplified by Figure 1. Here, participants move relatively quickly over the text of the main question (blue box near the top), briefly look at the agents (tutor agent male in the top left, peer agent female in the top right), and focus primarily on the circuit diagram (center).

Figure 1

Typical AutoTutor Visual Fixation Pattern



Visual fixation heat map showing most fixation on the circuit diagram with less on the question text and talking head avatars.

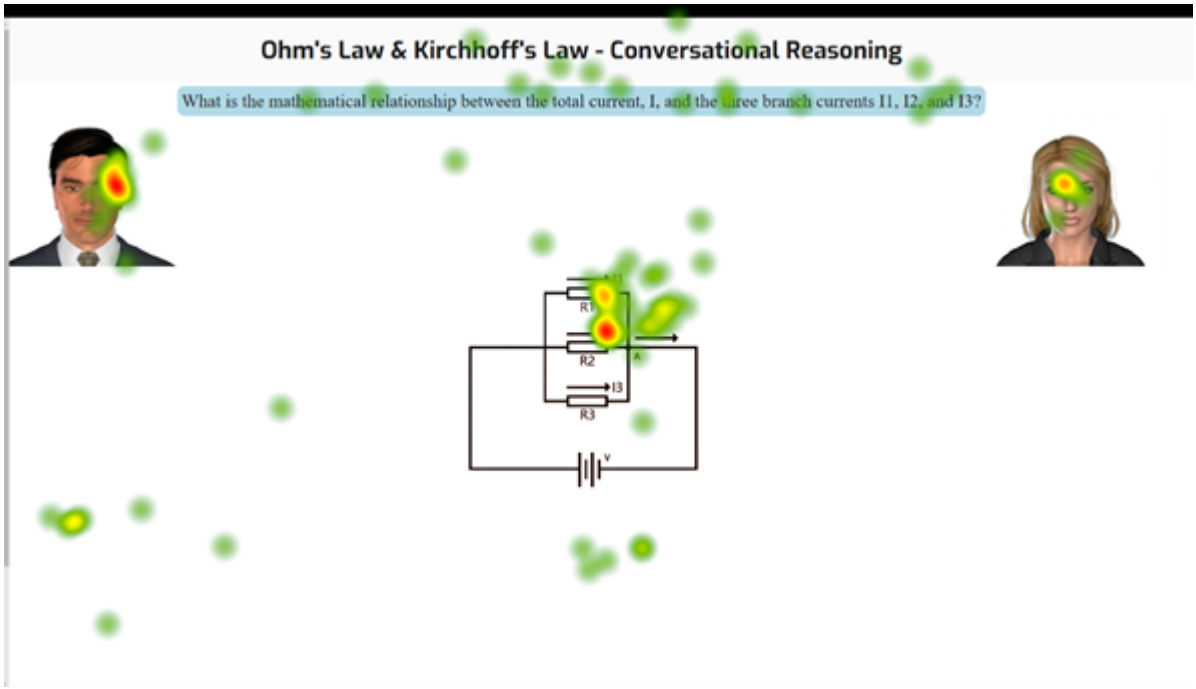
This is an appropriate fixation pattern. The visual presentation of the main question is redundant with auditory presentation and meant only for reference in case of confusion or uncertainty, therefore demanding minimal visual attention. Likewise, the agents provide social support when needed, but should not serve as a regular focal point. This pattern may serve as a point of reference for our potentially confusing situations below.

Incorrect Answers

This pattern changes substantially when participants give incorrect answers (see Figure 2). Here participants spend considerably more time viewing the agents. Notably, all the participants phrased their incorrect answers in a way that met the threshold for a correct answer (by virtue of using several relevant content words in structurally appropriate sentences). This means that AutoTutor responded in exactly the same way in both scenarios. The tutor agent posed the main question, the peer agent nominally agreed with the participant's input and then stated the correct answer, and the tutor agent affirmed, followed by a conversational transition to the next problem.

Figure 2

AutoTutor Visual Fixation Pattern Following Incorrect Input



Visual fixation heatmap showing roughly equal fixation on the circuit diagram and tutor talking head avatar, with some fixation on peer talking head avatar, and less on the question text.

Based on this visual fixation pattern and verbal participant reports, avoiding false alarms in error detection clearly does not come without cost. Many participants explicitly stated their confusion. One participant exemplified the struggle in his think-aloud transcript.

> *Instead of correcting it afterwards and explaining it instead is straight up just changed from being multiplied to, it says the sum of the three. Yeah. I just be confused 'cause it said two different things were right. When they are very different mathematical relationships.*

Another participant suffered even more confusion.

> *It really made me question whether or not I truly know electrical engineering or not, because last time I checked if the sum of all currents going into this one node is going to be equal to that output current . . . But, uh, I guess that's, that's false.*

We corrected this misconception along with an explanation of the technical issue during the debrief. None of the participants articulated the intended pedagogical strategy of correcting misconceptions implicitly by means of the summary at the end of the problem, or the technical concern of avoiding false alarms. Though we cannot say for certain if confusion would be higher or lower for learners who honestly gave incorrect answers, it seems clear that some alteration is necessary. Adjusting the bias likely invites a host of opposing but no less serious problems. Improvements to natural language processing diagnostics obviously offer incremental improvement, though at some (likely substantial) programming cost.

With the learning experience as the guiding principle (Tawfik et al., 2021), the most cost-effective improvement may reside in the conversational exchange framework. Perhaps designers can delineate an intermediate threshold of uncertainty that triggers a new transition. Instead of agreeing followed by a statement of the correct answer, the peer agent can indicate that she is submitting an independent answer without directly addressing the learner (e.g., "How about this answer. . ."). Given the relatively low match between the ideal answer and the learner's submission, the learner is unlikely to perceive this as the peer agent "stealing" a correct response. The relative cost (e.g., the learner feeling ignored) also seems low.

Questions

When instructed to pose their own questions to the agents, participants typically posed simple requests for clarification or additional information, as anticipated. These questions were almost entirely redundant with information provided in the Point & Query function or in dialogue. However, this did not prevent participants from becoming confused at the lack of direct response from the agents. The intended system response to learner-generated queries should consist of a hint, prompt, or pump. Two of these three options typically take the form of a question, resulting in a paradigm wherein AutoTutor "answers" learner questions with a question of its own.

Some participants found this frustrating if they attempted to persist in acquiring an answer.

> *I feel like I ended up more confused at the end 'cause every time I'd ask it a question it just kind of ignored it and asked me a different question and eventually just gave up and went through it but wasn't really leading me anywhere.*

Though this participant recognized the structure, she did not find it useful or seem to identify any benefit to the approach. Another participant explicitly noted the (correctly) perceived pedagogical strategy but did not feel it was used effectively and explicitly indicated the strategy for not engaging him.

> *It didn't directly answer my question. It answered my question with a question, which I guess is fine if it makes you want to think more. But, yeah, like if it had an answer along with a question to give you some type of reference to back it off of, that would've made it a little bit more intuitive. You know, just answering the question with another question is kind of repetitive. . . Not really engaging.*

These reactions, similar to the effect with incorrect answers, suggest the need for some design intervention. Once again, improved natural language processing offers improvement but at the cost of substantial programming effort and increased complexity in classification and response. However, two strategies for remediation immediately present themselves.

First, a minimal conversational transition could lessen the blow of such an abrupt transition to a new question. A relatively simple "canned" expression may indicate, if not comprehension then acknowledgement of the learner's input. "Hmm. . . well how about this:" before asking a conceptually related question would pose little risk of clashing with existing interactions.

Second, the almost complete overlap of questions asked and information provided elsewhere suggests that adequate design can prevent learners from constructing questions in the first place. A more detailed or interactive walkthrough of the AutoTutor Point & Query system may eliminate most questions. Further, the system already includes a function to review the full conversational exchange, but at least one participant searched for it without success. Providing affordances to convey existing functionality may essentially eliminate the shortcomings of question rerouting as a pedagogical strategy within conversational ITS.

Implications & Conclusions

One design implication relates to the use of a more computationally efficient approach to NLP without compromising the learning experience. Expense constitutes a critical barrier to entry for NLPs (Strubell et al., 2019), along with the lack of novice-friendly authoring tools needed to integrate the technology (Cai et al., 2015). In many cases, NLP in educational contexts requires a range of experts' input. Domain experts must work closely with script authoring experts knowledgeable in techniques such as latent semantic analysis to evaluate the distance in meaning between an expected answer and a novel one (e.g., Dumais, 2004), or epistemic network analysis (Shaffer et al., 2009) to granularly monitor the knowledge state of the learner. Depending on the complexity and maturity of the authoring tools, implementing these techniques in place may require ongoing coordination with computer scientists. Often the creator of the learning system serves as an indispensable component in this relationship, wearing one or more of these hats in

addition to project manager, and severely limiting development at scale. In this study, the approach to NLP attempted to mitigate this bottleneck by utilizing several less computationally intensive techniques, leveraging the constraints of the task and domain to avoid depreciation of the perceived intelligence of the system. However, that perception is unavoidably subjective and requires evaluation.

This study also has implications for how instructional designers should consider prompting cognitive disequilibrium in learners through AI. Indeed, theorists have argued that failure can be an important part of the learning experience and yield specific outcomes related to problem representation (Kapur, 2018), causal reasoning (Tawfik et al., 2015), decision-making (Rong & Cho, 2018), and others. The evidence suggests that failure often causes learners to reflect on the reason for failure, which leads to a more nuanced approach for the subsequent iteration of problem-solving. That said, the present study suggests designers must be careful about finding a balance between productive disequilibrium and cognitive overload. In this study, the unexpected dialogue moves by the AutoTutor agents caused confusion, self-doubt, and frustration. Additionally, participants did not assign value to the AI actions. These outcomes threaten the dynamic interaction between the learner and the learning space that promotes continued self-paced learning (Tawfik et al., 2021). Tawfik et al. (2021) identified both assignment of value and dynamic interaction as essential pieces of learning experience design (LXD). Instructional designs working with intelligent learning technology must consider these elements of LXD when contemplating the inclusion of similar AI promptings and interactions.

Another design implication relates to the affective response to AI interaction. Using AI tutors to promote context-based affective responses during online learning can lead to a desire to pursue learning and promote self-efficacy. As previously stated in the paper, cognitive disequilibrium is needed to advance learning. Learners generally wish to resolve the cognitive disequilibrium they are feeling, which can lead to active engagement with the content. However, the data suggest that if the AI creates too high of an affective response, users become highly confused, lose self-efficacy in their knowledge, and begin questioning their knowledge beyond the intent of the AI response. Using AI to generate appropriate levels of cognitive disequilibrium does have practical implications for those that wish to implement AI in their design and learning environment, namely, how to balance task complexity, AI response, and learner self-efficacy.

A learning environment, like conversation itself, is most effective when the participants understand the intentions and capabilities of their opposite number. Learners come into intelligent tutoring systems, and particularly conversational ITS, with expectations for how the system will behave. Those expectations do not seem to allow designers' concerns to supplant conversational norms without explanation. Computational, statistical, and pedagogical constraints do not factor highly into learners' anticipations and subsequent evaluations. This disconnect in models of interaction will likely lead to distrust and disengagement.

Structural adjustments to the task presentation and conversational frame may have the ability to lessen these substantial stumbling blocks with minimal computational effort or risk of interfering with other finely tuned interaction patterns. Vague conversational transitions on the way to existing pedagogical strategies may smooth what learners perceive as abrupt shifts. Improved design of affordances may prevent the need for interaction types to which conversational ITS are not well suited. By anticipating learner expectation, designers can improve the perceived intelligence of their systems and let their pedagogical strategies work optimally.

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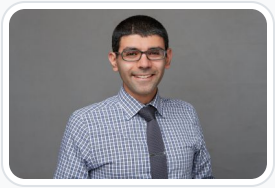

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