The canvas on which we paint: Instructors' perceptions of technology in higher education

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Abstract: As information and communications technology is rapidly developing across the globe in a variety of educational roles, research into the changing learning environment in higher education is needed. Since instructors are the first line for implementation, this phenomenological inquiry into their experiences with learning management systems and online tools is valuable for exploring how technology may impact pedagogy. This study draws on interviews and focus groups at eight U.S. institutions with instructors in first-year composition, a discipline that is highly text-oriented and especially suited to digital applications in both physical and online classrooms. Through the instructors' lived experiences with technology, we examine the emerging themes of change, the meaning of technology, student-centered motivation, identity, challenges, adaptation, and resistance. These findings contribute to understanding several nuanced issues that are not adequately described through quantitative data and point to needs for future research.

Keywords: technological change; identity; adaptation; active learning

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Introduction

An understanding of the complex web of factors impacting the adoption of technology in higher education remains elusive (Fathema, Shannon, & Ross, 2015; Ismail, 2016). Technology supplements traditional pedagogies as well as makes innovative strategies accessible. Despite its potential, integration of technology reveals a broad continuum of levels of adoption, a phenomenon that would benefit from further study. This study queries the technology experience of composition instructors who teach courses that are discussion-oriented and text-heavy. These courses are among the general education requirements across institutions of higher education, and they play an important role in the enculturation of students to the institution (Coertjens, Brahm, Trautwein, & Lindblom-Ylänne, 2017). The insights into the experience of technology in these courses are relevant to a broad spectrum of educators and administrators in academia who seek to equip students not only for higher education but also for future employment. Educators are inquiring how these digital resources impact learning (Siani, 2017) and the ethos of learning (Tham, 2016). In light of the changing environment, querying educator experiences with technology will further the inquiry regarding how to leverage technology and pedagogy for optimum student learning.

This study explores the lived experience of college writing instructors who interact with technology. Due to the acceleration of learning management systems and online tools in recent years, the perspectives of educators need updating to understand how beliefs change over time (Hammond, 2011). New knowledge from this proposed study will contribute to understanding how technology is integrated and how it is perceived to have impacted pedagogy in the last five years. These interviews also aim to reveal how instructors understand their identities as they adapt to changing environments. The research questions are inspired by research on identity by Winter (2009), who found that dissonance occurs for academicians who operate in the context of growing managerialism in higher education. In addition, Jiang (2016) wrote, "there is a need for scholarly works and pedagogical activities that describe how digital tools translate textual meanings across contexts [and] how these actors are assembled and reassembled in the network of digital learning" (p. 530). There is a scarcity of qualitative research from the perspective of educators, and Siani (2017) has promoted the need for further inquiry into how changing technology impacts pedagogy. This study hopes to further current research in a qualitative approach.

The purpose of this phenomenological study is to explore the perceptions of composition educators in order to understand their experiences with technology in pedagogies across courses and institutions. Technology includes software applications that enhance traditional classroom functions as well as technology that engenders online learning. With the rapid development of learning management systems and online tools,

this study hopes to capture the complex interaction of technology with pedagogy in higher education today.

Related literature

A review of technology literature confirms the value of querying instructors' perceptions in the midst of technological change. Sanga (2016) conducted a case study of 119 faculty in a single American university to understand the transition to a new learning management system and grounded the study in the framework for diffusion of innovation developed by Rogers (2003). This framework identifies five perceptions about innovations that impact their adoption: relative advantage, compatibility, trialability, observability, and complexity. According to Rogers (2003), perceptions are crucial in understanding human behavior, a theme that resonates with the current research.

In addition, one evolving theme relating to faculty perceptions is the concept of academic freedom regarding technology use. Craig and Harindranath (2015) note that technology utilization allows for "new forms of control of previously free and flexible academic practices" (p. 1). Their mixed methods study at a Jamaican university provides insights beyond the usual technical considerations as they query the impact on instructors. This concept provides another avenue for exploring instructors' perceptions of academic freedom and identity in a changing environment.

Current literature has identified the need for further research that incorporates learning values (Ain, Kaur, & Waheed, 2016), adaptation (Buchan, 2014), workload (Jones, 2015), technology issues (Sanga, 2016), effectiveness (Venkatesh, Croteau, & Rabah, 2014), and scaffolding transition (Westberry, McNaughton, Billot, & Gaeta, 2015). The phenomenological approach to this study differs from the existing peer-reviewed literature, which is largely from a post-positivist approach. Building on current research to explore the deeper issues and connections through qualitative inquiry adds significant data to the field. The perspectives of individual educators are mined to gain insights into their technology experiences in order to discover knowledge from multiple perspectives (Brinkmann & Kvale, 2015). As a result, qualitative analysis of the lived experience among writing instructors contributes toward a deeper understanding of how technology impacts pedagogy in the context of higher education.

Materials and methods

Theoretical framework for methodology

Lincoln and Guba (1985) propose a naturalistic framework for inquiry that seeks to uncover knowledge through trustworthy and authentic research that queries multiple perspectives in a balanced and conscientious approach. This approach presupposes the

validity of perceptions, which leads to the choice for this study of a phenomenological methodology that is designed to understand experience through the consciousness of lived experience among participants (Patton, 2014). Phenomenology rests on the philosophical assumption that lived experience reveals the essence of a phenomenon (Van Manen, 2016). In using the phenomenological method, we explore how writing instructors experience a technology—how they describe it, perceive it, make sense of it, judge it, and feel about it. This principle informs data collection through focus groups and interviews. This study is based on the concept of *verstehen,* which *"*stresses understanding that focuses on the meaning-making capacity of humans" (Patton, 2014, p. 56). For this reason, one important focus of this research is the meaning that instructors ascribe to technology in the context of their pedagogy. In light of this conceptual framework, the data gleaned contributes to a deeper understanding of technology utilization in higher education.

Setting

This study was conducted in the United States in the context of four-year and two-year institutions of higher education that provide first-year composition courses. In this setting, the dominant technology is the learning management system, which is used for "grade book, assessment tools, course materials, communication tools, interface, administration of classes, and student engagement" (Walker, Lindner, Murphrey, & Dooley, 2016, p. 41). This study includes technologies that enhance traditional classrooms as well as create online learning spaces. Other tools such as social media, blogs, wikis, and links are included in the inquiry of the impact of technology. First-year composition courses were targeted for this study since general education courses play a role in the enculturation of students to an institution (Coertjens et al., 2017). The average size of courses taught by the participants in this study was 22 students. These discussion-oriented and text-rich courses are often designed to introduce students to a community of inquiry, whether this community occurs in a physical classroom or online.

Participants

Instructors in this study are full-time (10), part-time (2), and graduate teaching assistants (2). The first focus group contained four writing instructors from a medium sized four-year institution, and the second group contained three writing instructors from a large two-year institution. Also, seven individual participants were interviewed from other institutions. The participants in the focus groups and interviews varied in experience from instructors in their first year of teaching to tenured professors with over 30 years experience.

Participants taught for institutions ranging geographically from the Northeastern United States (3) to the Southeastern United States (11). Four instructors were men, and 10 were women. Four of the instructors were in their sixties and had observed the technology evolution at their respective institutions. Two participants were graduate teaching assistants who experienced technology applications throughout undergraduate and graduate school. Between these two ends of the spectrum, the remaining instructors had an average of 11 years of teaching experience and had observed significant technology integration during their years as instructors.

Procedure

The inquiry utilized open-ended questions to explore how instructors make sense of the meaning of their courses when technology is integrated into the curriculum. Participants were recruited through departmental emails and volunteered directly to the researcher. Focus groups were face-to-face, and interviews were a combination of phone interviews and written exchanges. The same questions were used for all participants. The research process was pre-approved by the IRB, and security and confidentiality standards were maintained throughout the study.

During interviews and focus groups, the discussion was facilitated by applying the exploratory methodology of Brinkmann and Kvale (2015). The lead researcher transcribed the recordings of each focus group and interview using a verbatim method with cues such as laughter in brackets. The transcripts were sent for member checks, and additional clarifications were added to the data as directed by participants.

The researcher followed a phenomenological methodology of analysis by first reading for holistic meaning, making memos, finding natural meaning units, and then thematizing these meaning units (Van Manen, 2016). The themes were queried according to the purpose of the study, and saturation in the qualitative analysis process was sought by reading and coding until no new themes emerged. This process stimulated returning to the research literature to discuss findings in light of current research.

Results

The purpose of this research is to query instructor perceptions of technology in the learning space. Analysis of transcripts from focus groups and interviews produced 58 significant statements, which were clustered to create eight emerging themes. These themes were developed using instructor quotes to create a dialogue to give voice to a diversity of perceptions and encourage further discussion.

Change

The rapid evolution of technology in the classroom has profoundly changed how instructors communicate and transfer information. Most instructors described incremental adoption over time, but they perceived that in the last five years they had experienced a transition to a near-paperless classroom. The primary technology in higher education is the learning management system, but other applications such as social media, blogs, wikis, and videoconferencing are utilized. With the technology evolution, instructors adopted new approaches to learning such as collaborative projects, online office hours, and assigning multimedia projects for students. As Garrison (2016) observes, the new potential for information transmission is changing how instructors teach and students learn.

Many instructors observed that it was the norm to have computers in the classroom, and this phenomenon created "a far more interactive environment." Their changing pedagogy leverages student computers for in-class writing, peer review, online drills, and class discussion. An example of the latter is a professor who teaches the concept of writing a thesis sentence by having students submit their samples for a class discussion of the elements that work and do not work. This constructivist approach to learning utilizes the ease of digital submission and projection on a classroom computer screen. Instructors asserted that in-class computers made active learning in the classroom a dominant pedagogy. While some institutions provided computer-equipped classrooms, other institutions expected students to bring laptops to class. Finally, some instructors challenge students to build a learning community through asynchronous technology such as discussion boards, blogs, and journals, thus enlarging the learning space to include the online classroom.

A major focus of technology change involved management of student writing assignments. According to those interviewed, in a single decade their institutions had transitioned to paperless transmission of assignments. Student essays are uploaded digitally, and the essays with instructor comments are returned digitally. In this new online environment, instructors reported changes in their pedagogy such as becoming "more holistic in feedback" and "more succinct." As one participant stated, "No rambling allowed. Students have small 'screen' attention spans, so I need to get in with the information, then get out." Though a few instructors expressed a preference for paper manuscripts, they explained that at the same time, they "could not imagine teaching a course without the learning management system."

The meaning of technology

In a changing environment, instructors ascribed meaning to the new technology as a *tool* with examples of "communication depot", "learning community for students", and "digital archive." Some gave detailed explanations for how they use digital applications to fulfill course goals or scaffold learning experiences. One participant noted how learning management systems and other technologies had become ubiquitous in the classroom and posited, "It is more like the canvas on which we paint. There was a time when we just added one application at a time, but now it is the backdrop of our curriculum". Another instructor explained in regard to the institution's learning management system, "it is an extension of myself, a medium through which I communicate with the students." In many comments, evidence of increasing integration of technology with curriculum was evident.

Significantly, instructors make meaning of technology for the explicit purpose of serving and teaching students. One instructor explained that it is "a more interactive and transparent digital correspondence between my students and me." Many instructors perceived a more effective and thorough means of communication. This communication extended to the importance of giving students the ability to express themselves in a wider community. As one instructor said, "the students post responses to the discussion questions I pose, and then we review them in class. The students get a voice, and I get to hear them refine their ideas throughout the semester." Some instructors expect students to participate in blogs and journals to build a learning community. They have made meaning of technology as a means for extending the learning space beyond the physical classroom to create community.

This idea of extending the physical classroom was repeated in several interviews. One instructor explained, "In my face-to-face courses, it has freed me to add lots of extra pieces that I can't always get to in the classroom." Another instructor said, "I value the supplementary material that is banked within the learning management system and available for all students and courses. Topics like study skills or grammar can be recommended to students." Scaffolding also takes place outside the classroom as one instructor shared, "I can use it to model how to fulfill assignments". Instructors adopt technology and incorporate it into their pedagogy, and they make sense of the innovations in the context of adding value to the students' learning experience.

Student-centered motivation

A significant theme is the motivation to support and teach students. For many instructors, this leads to taking time to teach technology to students to ensure they have the tools they need. Some instructors even described accommodating students who have technology challenges. Overall, the participant instructors feel that mastering technology

is an essential aspect of higher education: "It benefits them in their future career because technology becomes such an important part." The instructors' primary motivation to use technology is to benefit students, both in learning course content and in mastering technology skills critical to their future.

One instructor said, "My epiphany was how incredible it was for them to have access to all the physical handouts. If they were working on their lunch hour, they could have it immediately at their fingertips." This concept of accessibility was repeatedly described during interviews and focus groups. Another instructor explained, "Some students have accommodation plans, so technology serves as a comfort zone for them to freely and repeatedly access." Another aspect of student-centered motivation is the leveraging of technology that many instructors manifested. One instructor found that students benefitted from recorded comments that she made within the learning management system. Another instructor used a variety of media to help students "visualize the material." She explained that she now thinks in terms of pictures, audio, and hyperlinks to enhance her lessons and reach a multitude of learning styles.

Finally, instructors agreed that students appreciate the rapid feedback afforded by technology: "They can keep up with their progress at any given time because their grades are constantly updated after every class." They can also communicate easily with instructors when they have questions about grades or assignments. Instructors find that they can credibly administer formative assessment since students receive feedback early and dialogue with the instructor on how to improve.

Identity

One of the most powerful themes was the concept of instructor identity and how it was impacted by technology integration. Many educators reported a strong face-to-face identity for their pedagogy and considered technology a tool to serve this primary pedagogy. As one instructor said, "It has made my life more convenient and cheaper, but it hasn't changed my teacher persona at all." Others shared how their pedagogy had changed over the years so that technology became an integral part of their teaching identity. They project an inclusive tone to students by utilizing frequent announcements to reach out to students and orient them to assignments. They feel that they are more organized and prepared ahead of time so that students understand what is expected of them. Regardless of the level of integration, many instructors believed they are now "more adaptable," "more focused," and "more oriented toward active learning" with the advent of technology in their courses.

Another interesting theme of identity was a subtle shift away from learning that is dependent on the instructor's persona. As one instructor explained, "I am less egocentric—more student-centric—a lot of the quality of how they learn—it's really up to

them." Technology allows for collaborative projects, constructivist learning through discussion boards, formative assessment through rubrics, and an increase in writing practice. It also allows the instructor to equip students more thoroughly than was possible in the past through physical handouts and reminders in class. One instructor stated that a decade ago it was common for her to print assignments and distribute them to those who missed a class. With learning management systems in higher education, students now access resources online. They are responsible for retrieving assignments and following directions, independent of teacher intervention.

The shadow side of technology can also impact instructors. One instructor said, "I do like that we're using a learning management system in addition to having on-campus classes. I think just to teach online, I would definitely struggle with losing my identity." Another participant explained how the barrier of technology could make instructors seem anonymous to students: "They lose the fact that there is a person behind those words. They hear a harsher tone, so I have to combat that a little bit when I do meet with them face-to-face or talk to them on the phone". Also, several instructors struggled with projecting a supportive atmosphere while at the same time creating healthy barriers. As one instructor explained, "I tell my students that I am available during the work week, but they will have to wait for answers to questions that are posted over the weekend." Several instructors described ways that they worked to construct an online persona that was "human," so that students would respect them as people.

Challenges

Issues inherent to technology cause challenges. One instructor expressed a common idea: "There is a need for students to acclimate to both the course and the learning management system technology." Instructors felt that part of their course objectives needed to include mastery of the required technology in the course, and even noted, "Sometimes technology works against them." For composition instructors, technology training is a new area of course content, and it impacts cognitive load and learning pace for students. As one instructor noted, "students seem to have figured it out by mid-semester, and then the real [subject] learning can take place."

Another difficulty for educators is the need to adapt to a rapidly changing array of technology: "I was becoming adept at the old system, but then an upgrade came upon our land, and I had to start all over again as the file transfers were quite lame." Instructors also noted the danger of loss of documents: "It is certainly convenient to have so much data stored within these digital spaces, but we also have to keep in mind that our access to these spaces can be ephemeral." In this instance, some access to student documents from former semesters was lost when a new learning management system was

implemented. Finally, the possibility of technology failures, whether for a local computer or an entire system, can be a problem.

Some of these challenges provide teaching moments for life lessons. Since anonymity online is a social danger, one instructor stated, "I remind my students to ask themselves if they would say what they've written directly to another person face to face. If the answer is no, they should revise before they post." The digital environment comes with inherent challenges that impact course content beyond the traditional curriculum.

Adaptation

Instructors reported adapting technology in a variety of ways, but the most significant realization was the potential of adaptation itself. One instructor said, "That was probably an epiphany for me—how I could individualize it." Another instructor who dealt with seeming too abrupt in online interactions said, "I learned to lighten up my posts with jokes." Not only could technology be leveraged to enhance pedagogy and teacher-student relationships, but it could also be used to build relationships in the learning community: "There's the latitude to encourage interactions and students learning from each other." One instructor keeps a running list of student insights that he shares with all sections of a single course, including sections that take place in the face-to-face classroom. He explained, "They often miss out on this rich interchange if they don't participate in the online discussions."

The possibilities for technology also engendered creative adaptations. One instructor narrated, "I record audio feedback for students so they can look at the paper on their computer screens while listening to my comments. The auditory comments create a personalized identity." One institution adapted portfolio sharing among instructors to contribute to consistency in grading across composition courses: "We exchange the files among ourselves for a second opinion, and the unified system of the learning management system makes that possible." Instructors also report using links to resources, introducing film clips in class, and adopting other innovative applications of technology. The element of agency, defined by Tourish (2014) as "the capacity to take action" (p. 80), is a strong positive motivation for instructors to adapt technology for their students.

A final area of adaptation is the adaptation of space. One instructor said, "It allows me to interact with students, even if I have to be away from the classroom for a class or two." Another instructor explained, "I spend most of my fifteen hours of office hours communicating with students via the learning management system." Learning can occur even when the instructor is not physically present with the students. Instructors consider this adaptation as one of the strengths of technology use in the classroom.

Resistance

Resistance was a smaller theme in focus groups but a larger theme in individual interviews. As one instructor explained her reason for using the technology at her institution, "They make me. [laughter] That is why I use it." Another educator said, "But you know, I just roll with it because that's what's required." Some instructors blamed their resistance on technology difficulties, as in this observation: "If it takes me more than two hours to figure it out, I'm frustrated." Another instructor explained, "The online rubric does not play well with the rest of the learning management system, and for this reason is rarely used."

In addition to inherent technology challenges, some instructors attributed resistance to loss of agency in choosing how to use technology. Some institutions have a tightly controlled curriculum embedded in the learning management system, which removes the ability to adapt lesson plans, create quizzes, or assign online exercises. One instructor said, "I would use it a whole lot more and actually did use it a whole lot more in the past when we were able to modify it and use the functions." The aspect of agency in integrating technology became one of the important applications from the theme of resistance.

Several instructors told the story of early opposition to technology that changed over time: "I was at first definitely opposed to it. I just didn't like everything being electronically submitted." Composition courses are heavily dependent on textual submissions and textual interchanges with instructors, and the transition to a paperless exchange was harder for some instructors than for others. At the same time, most instructors evaluated the evolution of technology in their classrooms and realized that they had accommodated to the new learning environment. However, it was common for these late adopters to be resisting another current innovation, such as online grading. This phenomenon aligns with the description from Christensen, Horn, and Staker (2013) of those who populate the far end of the spectrum from early adopters to late adopters. Often late adopters lag behind their peers, adopting an innovation after it has already become standard practice. In this sense, resistance may be an operator-dependent phenomenon rather than a fundamental element of a particular technology. Consistent with various models of diffusion (Fathema et al., 2015), the element of resistance traces its roots to several factors.

Discussion

Instructors' experience of technology gives rise to emerging themes of change, the meaning of technology, student-centered motivation, identity, challenges, adaptation, and resistance. The dialogue with educators revealed how technology is an innovation that

changes not only the environment but also pedagogy. Christensen, Johnson, and Horn (2011) developed a model of disruptive technology that serves a population in new ways with new modes, and higher education is experiencing this phenomenon. Baldwin (2015) explored this concept in the composition classroom and concluded that integrated modalities extend learning potential. The advent of learning management systems and other technologies is rapidly transforming the learning space, especially in classes that are discussion-oriented and text-heavy. The key role of these courses in the enculturation of students to the institution now extends to connecting them with the learning community by integrating technology. The result of this disruptive technology is seen in pedagogies across higher education institutions.

In the context of higher education, instructors find meaning in technology as a tool, which corroborates research that identifies perceptions of utility as a leading factor in adoption (Sanga, 2016). Our participants confirmed that the goal of benefitting students is a primary motivation for implementation, in line with the research of Salajan, Welch, Ray, and Peterson (2015). This phenomenon strengthens instructors' identities to serve and teach students and produces a trend toward more active learning. The aspect of active learning correlates to research by Garrison (2016) on the impact of communities of inquiry in both face-to-face and online interactions. In addition, Hammond (2011) identifies instructor beliefs that learning is constructivist, and since the time of Hammond (2011), technology has accelerated the transition of pedagogy to more constructivist and active learning models. For example, in research seven years ago by Garrote and Pettersson (2011), the authors identified the need for integration of technology at the curriculum level since most professors in their study only used distribution functions of technology. Our participants, on the other hand, observed the rapid integration of learning management systems and online technology into the curriculum over the last five years with more active learning pedagogies. Through comments on how they incorporated learning management systems and other online tools into their pedagogy, they demonstrated how this technology has become part of their identity as an instructor.

The themes of challenges, adoption, and resistance are common in technology research, and a growing body of literature identifies attitude towards technology as a significant factor in overcoming challenges (Fathema et al., 2015). The participants in our inquiry reveal a connection between perceptions of agency and attitude toward technology. Active roles in determining how to apply technology seemed to result in increased integration. These themes emphasize the value that instructors place on agency as they integrate technology functions in their pedagogy.

Future Study

Though this study was conducted in the United States, it develops potential research questions in an increasingly global education environment. International studies are converging on similar important themes such as the learning value placed on technology (Ain, et al., 2016), impacts of technology use (Craig & Harindranath, 2015), and policy issues (Ismail, 2016). These studies research higher education in Malaysia, Jamaica, and the United Arab Emirates, respectively.

In institutions throughout the world, the impact of perceptions of agency on technology adoption would be a strong area for future research. In addition, several instructors articulated the idea that technology enables them to be more student-centric as the focus shifts from classroom lecture to active learning. This concept of student-centric learning would be a valuable area of research to understand whether the evolution of student-centric learning is impacting mastery of course objectives. Finally, these instructors describe the integration of technology into their curriculum and pedagogy in a way that increases interactive learning online. Castaño-Muñoz, Duart, and Sancho-Vinuesa (2014) in Spain observed a similar phenomenon in their research on active learning; this element of technology impact would benefit from further study. In disciplines that are discussion-oriented and text-heavy, active learning practices such as online peer review and discussion boards could be studied for their impact on learning for both traditional and online classes.

Implications for educators

The exploration of technology utilization reveals not only aspects of diffusion, but the underlying motivation for implementation. The participants made meaning of the advent of technology integration through their identity as instructors to teach and serve students. Though early literature review studied aspects of loss of academic freedom through mandated technology use, this element was largely absent from the focus groups and interviews. Instead, these composition instructors perceived themselves as agents in integrating technology to fit student needs and their personal pedagogy.

The concept of active learning was a significant factor in how instructors integrated technology elements into courses. For example, some instructors utilize technology to enhance their classroom pedagogy with a constructivist approach, while others leveraged technology to extend the learning space beyond the physical classroom. These insights into evolving pedagogies that integrate technology may inform instructors and administrators who are considering technology expansion and integration.

Conclusion

These findings help explain several nuanced issues that are not adequately described through quantitative data. The phenomenon of the impact of technology on instructors is initiated by change, which engenders responses characterized by acknowledged challenges, creative adaptation, and occasional resistance. Together these responses build toward instructors making meaning of technology as a tool to serve students, which is their primary motivation. Several participants noted how technology has led to an active learning pedagogy, which is more like the grounding for curriculum rather than an "add-on." The change, responses, meaning-making, and motivation stimulate new perceptions of identity in a changing learning environment, in which technology is "the canvas on which we paint."

Understanding more about this phenomenon on a global scale from the educators' perspectives could help academicians evaluate the efficacy and future integration of technology in their curricula. Additionally, the shared experiences represented in the study may further the conversation of how a changing environment transforms pedagogy. The insights gleaned will hopefully provide context and ongoing discussion for educators.

Declaration of interest statement:

The author confirms that there are no known conflicts of interest associated with this research study and there has been no financial support that could influence outcomes.

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