

# Patient Experience Design: Expanding Usability Methodologies for Healthcare

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## ABSTRACT

Successfully engaging in a health- or medical-related activity is a matter of understanding what one needs to do. This means information used in this context needs to be easy to use. Accomplishing the goals laid out in the essay will facilitate understanding and allow for effective use. Thus, successful medical and health communication are connected to one central concept: usability. But how to achieve this goal? The answer is through patient-focused design practices that help mirror the experiences of patients who are using such materials. This entry overviews such an approach – which I call patient experience design (PXD) – and explains why such an approach is central to best health and medical communication practices.

## Categories and Subject Descriptors

H.0 Information Systems: General

## General Terms

Human Factors, Design, Documentation

## Keywords

Methodology, patient education materials, usability, health literacy, embodiment

## INTRODUCTION

Recent research (Angeli & Norwood, 2016; Rose, 2017) has suggested that new usability methods and theories are necessary for working in health and medical contexts. This research and the questions it raised intersected with my own critical reflection. Why was I thinking about usability methods and healthcare? Because as part of a larger research project (discussed below), our research team had recently experienced a failure of current usability methods when creating and testing patient education materials (PEMs).

The research project on PEMs, and its ensuing problems and successes, intersected with my thinking about “patient experience design (PXD)” (Meloncon, 2016). In that original exploration and explanation, I argued that a new term was necessary because our existing terminology (e.g., user experience, usability, participatory design) was not adequate to capture the necessary attitude that researchers and practitioners need to do user experience and usability work in healthcare contexts. Here, I expand my original conception of patient experience design through a case study of an in-progress research project on PEMs.

To begin I provide an overview of the need to expand the field’s approaches to user experience and the need to incorporate new methods of usability by providing an overview of current, relevant scholarship. Then I explain what PXD is, why it is needed and the essay ends with the implications of PXD as a methodological construct for the field of technical communication.

## BACKGROUND AND EXIGENCIES

The federal government has identified health communication “as a critical area,” which is evidenced in the continuation of this focus in Healthy People 2020. In addition, other initiatives, such as Agency for Healthcare Research and Quality (AHRQ) (<http://www.ahrq.gov/>); Patient-Centered Outcomes Research Institute (<http://www.pcori.org/>); and the Institute for Patient-and Family-Centered Care (<http://www.ipfcc.org/>), point to the increased importance of communication in health care.

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Increasing the urgency for technical communicators, in particular, AHRQ has reported that a total of 90 million Americans lack health literacy and numeracy skills to productively participate and engage in their own health care (<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>). One of the primary avenues in which health literacy comes to the fore is in patient education materials (PEMs). For those unfamiliar with the range and scope of PEMs, examples include patient discharge instructions, informational materials to help patients make informed decisions, informational materials created specifically for use in shared decision making, take-home instructions, information on nutrition or exercise, information to help educate to potentially change behaviors, pharmaceutical pamphlets explaining drugs uses and interactions (known in the EU and other countries as patient information leaflets), and information on conditions or symptoms found in online portals. The US National Library of Medicine advises that the basic priorities of PEMs should be

- What your patient needs to do and why
- When your patient can expect results (if applicable)
- Warning signs (if any) your patient should watch for
- What your patient should do if a problem occurs
- Who your patient should contact for questions or concerns (<https://medlineplus.gov/ency/patientinstructions/000455.htm>)

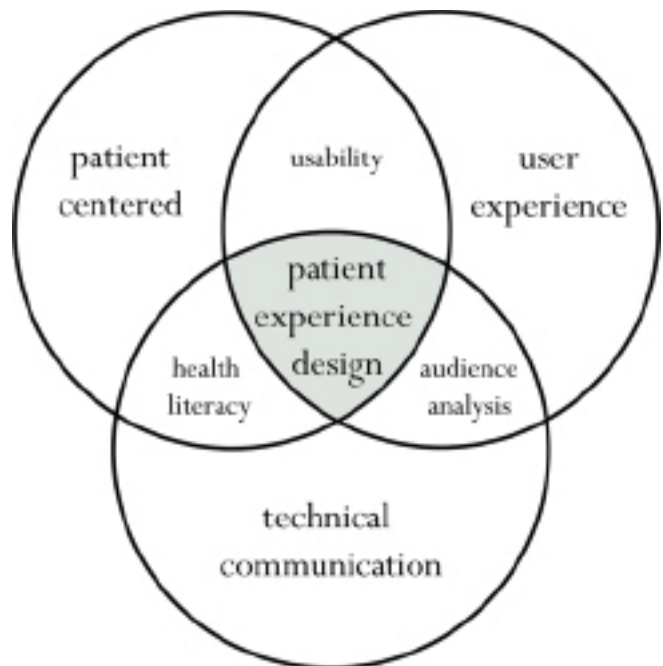
PEMs can be delivered in a variety of ways from printed materials, interactive websites, videos, classes, or demonstrations. From the description of the products and their purposes, one can see how PEMs fall under the umbrella of technical communication. While PEM uses patient in its terminology, it is actually a misnomer because not all targeted users of PEMs are actually patients, who are defined by Greenhalgh (2017) as “people who are seeing or receiving healthcare” (p.100). PEMs can be, and often are, created for “not-yet patients” to disseminate health and medical information and attempt to change behavior to improve overall health and well-being. They are also produced for actual patients, their caregivers or family members or for policy makers, health professionals or any number of other stakeholders. However, for ease of reading, I use patient as a stand-in for all of the multiple audiences of PEMs.

Most every technical communicator has struggled with the question, “What do you do?” but I found this question even harder to answer in the health and medical domains. For a while I found myself falling back on the tired and partial metaphors found in technical communication’s history using things such as “translator,” “bridging the gap between doctors and patients,” or using health literacy as a catchall term since almost all health care professionals believe they know what it means. I found these explanations exhausting, incomplete, and unsatisfying. Even though I have never been an advocate of creating new terms, I found myself creating one: patient experience design (PXD), which most simply defined is a participatory methodological approach centered on contextual inquiry to understand the relationship between information (or technology) and human activities in health care. So how and why did I land on this term?

PXD’s strength lies in bringing together existing practices and terminology in new, innovative ways, or in theory building. de Jong (2014) encouraged technical communicators to move toward

theory, and one area that he posited could be a theoretical direction is examining the relationships of usability with the overall user experience. In a recent collection on methodologies in the field of rhetoric of the health and medicine (RHM), Scott and Meloncon (2017) “argue theory building should be recognized as an important methodological goal” (p. 12). PXD looks to build theory because “without an inventive approach to theory, we lose our ability to notice different things in familiar phenomena and sites, and to make sense of happenings in less familiar sites” (Scott & Meloncon, 2017, p. 12). More directly, without theory building, we lose the ability to see our existing research in new and ultimately, more useful ways. Using methodology as “a theory and analysis of how research does or should proceed” (Harding, 1997, p. 3), PXD brings together a number of important strands of existing scholarship. Much like piecing Legos together in new and inventive ways, PXD encourages a different attitude toward the research process by participating in a “‘methodological mutability’—a willingness and even obligation to pragmatically and ethically adjust aspects of methodology to changing exigencies, conditions, and relationships” (Scott & Meloncon, 2017, p. 5). Broadly, PXD brings together patient-centered values (as used by healthcare practitioners), user experience, and technical communication. In its landmark 2001 report, “Crossing the Quality Chasm,” the Institute of Medicine (IOM) identified patient-centeredness as one of six aims for the health care system. They defined patient-centeredness as providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions. This emphasis on the patient is reminiscent of the primacy of the audience in user experience. Thus, patient centeredness and UX intersect and complement one another. When one adds technical communication into the mix, the relationships among the three can be visualized as seen in Figure 1.

Figure 1 illustrates the overlaps and relationships between patient-centered, user experience and technical communication by taking the key facets of each domain, e.g., technical communication



**Figure 1: Knowledge domains of PXD**

= audience analysis and the language as materialized in health literacy. This was my first attempt at visualizing my thinking that was putting a number of scholarly traditions together in a different way. However, since working with it, and in some ways, failing, on a research project creating PEMs, I realized that the above configuration, Figure 1, was not wholly adequate. It was missing key components. In the next section, I describe an ongoing-research project and point to a series of limitations of the original conception of PXD, which also reflect limitations within current user experience and usability research.

## RESEARCH PROJECT

As part of a multi-institution research project that is working to understand how better to design health and medical information, we have designed a multi-part research study to address the concern that most existing research on information design in health care contexts tends to focus on either attention grabbing aspects (such as data visualizations or document design) or comprehension, i.e., does a patient understand the information (Houts et al., 2006; Meloncon & Warner, 2017; St.Amant & Meloncon, 2015). One part of this project involved creating PEMs for college-age students to educate and to inform them about the risks of sexually transmitted diseases (STDs). In 2016, the US Center for Disease Control and Prevention released a report that STDs were at an unprecedented high level due to an increase was found in college-age adults. These results have raised concerns on college campuses and forced college health centers to engage in educating student populations. With the assistance of a technical communication graduate class in information design, the research team set out to create and to test two different versions of a PEM. The versions would contain the same information, but they would be designed differently.

To prepare us for the project, the research team went to the literature to understand current conceptions of user experience. While technical communication scholars have recently argued for an expansion of theories of usability and user experience (e.g., Rivers & Söderlund, 2016; Simmons & Zoetewey, 2012), they do not address health care settings. This fact made us (re)consider that since usability and user experience are vast domains of knowledge that span multiple disciplines, we would need limit our search to studies that addressed both usability and health care. Being intentionally selective in the literature review led to representative works that employed usability methods to test PEMs or usability methods to test health communication more broadly. We also excluded usability of health information technology (such as electronic medical records or customized apps,) because our focus is on the information and on the content and comprehension of that information rather than the technology and too much current work in usability focuses almost exclusively on the technology. (Granted, this claim is contestable, but for space considerations alone, there is no way to fully address this issue.)

In fields outside of technical communication, researchers primarily approach usability and health care by traditional means of the ease of use of some technology. For example, user experience researcher Marcial (2014) provided an overview of how usability can help solve “wicked problems” in healthcare by focusing specifically on healthcare systems design such as electronic health records. Similar to Marcial (2014), one can find a number of studies conducted by technology specialists or computer scientists that focus on improving patient safety (e.g., Middleton et al., 2013; Zhang et al., 2003) or gaining understandings of the use and function electronic medical

records (e.g., Johnson et al. 2011). This research has begun to be more patient-centered by approaching the research project from a user-centered perspective, but in studies such as these, the focus on the system rather than on the patient leaves the approaches ill-suited for more patient-centered activities such as creating PEMs.

More patient-centered work can be found in a small number of studies done by technical communicators. These studies all examine patient information leaflets (Dolk et al., 2011; Lentz et al., 2014; Maat & Lentz 2010; Maat et al. 2011), which is the term used in Europe to describe the medical conditions, doses, and side effects of prescription medicines. Certain laws (such as in Australia and the European Medicines Agency in EU countries) mandate the creation and use of these leaflets. What this work, combined with scholarship discussed below, told us was that technical communicators have many opportunities to participate—and directly affect—health and medical information.

From our literature review and from creating and testing PEMs, we learned three important lessons: contexts of use needs to be better theorized; participatory design has not been sufficiently embodied, which would make it more meaningful as a method and methodology; and standard usability methods (e.g., think aloud protocols, card sorting) are not sufficiently developed to work in health care contexts. These lessons are the focus of the next three sections.

## CONTEXTS OF USE

Gouge’s (2016) discussion of patient discharge communication and instructions provided technical communication an excellent example of where, and how, technical communication should be intervening in health care settings, and more importantly, the need for new theoretical approaches specific to contexts of use. Her analysis of patient discharge information and instructions illuminated the documents’ failure to achieve some of their rhetorical aims, which suggests a need for an expansion of user experience theories and usability methods. Improved patient discharge instructions allows patients and care givers the opportunity to provide better at home care and can potentially save costs by limiting follow-up calls and visits and in worst cases, a re-admittance. Gouge (2016) concluded that new information design approaches are necessary because current approaches need to “[let] go of the hyperstandardization as an abstract ideal and [accept] that complex information for end users includes the adaptations they must manage . . . whatever approach we choose to follow to address this challenge, we need to consider approaches that can recognize and work with the improvisational aspects of transitional care communication events” (p. 17). Gouge’s concern about adapting information to account for the end users opens up an opportunity for technical communicators.

The primary component missing from current usability methods and user experience theories is what I refer to as a context problem. Gouge (2016) highlights this issue when she asserts that patient discharge instructions do not function appropriately because those who created them did not take into full consideration the myriad of complexities and nuances of the context in which the patient (and others) would use the information. Thus, current theoretical orientations do not sufficiently account for unique health and medical contexts. Gouge (2016) rightly points out that this failure of context cannot adequately be met with current usability practices. Further, existing participatory design approaches often fail to take into consideration the varying contexts of use, instead focusing

solely on patient participation in the design process. Sparud-Lundin et al. (2013) acknowledged that context accentuated the different demands that were necessary for participatory design process because “participatory design per se is not a guarantee for person-centeredness” (p. 379) because of the different contexts in which patients use the information.

PXD as it is conceived takes into account these varying contexts and tries to address them from the beginning of the process. It is essential that in designing PEMs all team members understand the context for use from the patient perspective. Both patient and caregivers will often use patient discharge instructions so the design and information needs to take that context into use. The patient and the caregiver are most likely to approach the use of the PEM in different ways, at different times, and in different circumstances. For example, the patient may need to refer to the PEMs in the bed, while it is likely that a caregiver may refer to them while sitting in another room and without the patient present or as St.Amant (2017) recently argued, others will be taking place in intercultural and international contexts. Thus, PXD shifts the methodological approach of existing usability methods, such as participatory design, by highlighting not only the information from the patient/user but also the context of use. This emphasis on patient and use extends the primary tenets of technical communication and its integration with usability studies generally.

To better understand how this is accomplished takes rethinking context. Technical communicators have long understood the importance of context. Described in rhetorical terms as the “rhetorical situation,” context means an attention to circumstance of production of discourse (or information) that includes the purpose, audience, and other situational factors that will affect the use of information. For example, one of the reasons our PEMs on STDs project failed was that we did not fully consider the context of use. We had created the PEMs for distribution at a student health center at a university or college campus. One attempt at testing failed to consider that students in a religiously, conservative region of the US would likely never go to the student health center for information about or treatment for an STD. We realized this when our attempts to test the material with graduate students at such an institution failed. The students insisted that they would never need this information because they adhered to an abstinence only policy. They outright refused to participate.

This experience highlighted that our current theoretical models of context are insufficient. Rice (2005) was one of the first scholars to offer a theoretical expansion of context. In introducing “rhetorical ecologies,” she emphasized the complexities of context by arguing the “rhetorical situation” was in constant flux and not self-contained as a bounded “situation.” By using the ecological metaphor, Rice (2005) highlighted the dynamic nature of nature itself, and drew attention to the symbiosis of the different parts of the ecological system. In addition, thinking of context as an ecology emphasizes the interplay and relationships between texts, people, events and contexts of use.

Since the publication of Rice’s (2005) work, scholars have tended to emphasize the vastness of context by building on the ecological model (e.g., Jensen, 2015) and discussing context as network (e.g., Dingo, 2012; Rice, 2012) or assemblage (e.g., Wingard, 2013). These metaphorical configurations illustrate the fluidity and instability of the context of use and account for the always changing and evolving nature of contexts. While this scholarship

has considered the scale of context as bigger and more complex, I want to go in the opposite direction—to scale back the size to specific, localized contexts of use. In doing so, researchers can gain an increased understanding and awareness of the specific moments of use. To start this movement to smaller scales of context, I turn to the work of medical anthropologist, MacPhail (2014).

In studying the global health care crisis of the H1N1 pandemic, MacPhail (2014) wrote a metanarrative of the disease through extensive fieldwork, which provides a nuanced and alternative understanding of context that is important to PXD. Her work at the CDC resulted in an “anthropology of information,” where she examined “how information in global public health networks is produced, managed, understood, and circulated during an outbreak” (p. 154). Working with epidemiologists and virologists at the CDC, she came to understand that “context” was a key feature of what makes information “good.” For MacPhail (2014) and her informants, “context refers to the fusion of clinical and personal experience and intuition about a disease outbreak . . . involving human relationships and daily practices and experiences at the heart of both the production and the understanding of epidemiological information” (p. 155). This emphasis on context that requires experience and intuition has the potential to be an important moment for technical communication and rhetorical scholarship because a full understanding of the “human relationships and daily practices and experiences” are central to the production and use of information. More importantly, MacPhail (2014), by focusing on individual experience, has reduced the scale of the context. This reduction of context holds a promise for creating PEMs in health care settings because it places the contextual emphasis back within reach of the patient. The reduction of contextual scale also does something much more important. It allows researchers the opportunity to identify the critical forces at work that can affect the understanding and use of PEMs (or any other health information).

Current scholarship that insists on larger and more complex contexts suggests that everything in an ecology (or network, etc.) reverberates equally from everything else. But it does not. There are parts of the ecology that have more force and function in effecting outcomes than other parts. By shrinking the scale of context, it becomes easier to determine what part of the context has more force and function. In the example of the PEMs on STDs, shrinking the context would have helped us to see that the point of emphasis needed to start with the deeply held beliefs of the audience. Context is the “creative synthesis of personal knowledge and impersonal data. Without context, facts . . . are still viewed with a certain suspicion as to their soundness or applicability” (MacPhail, 2014, p. 155). This was part of the contexts of use (and audience analysis discussed in the next section) that the entire research team failed to consider in part because we are not trained to look at small contexts.

Not being able to narrow down contexts of use means we were unable to see the point within the “ecology” that actually had more force than other parts. MacPhail (2014) argued for understanding “past, lived experience as context,” and for health care contexts and PEMs, it is vital that researchers and practitioners are able to shrink the context to analyze what specific past lived experiences may impact current care. Much like global public health (the subject of MacPhail’s 2014 study), the US health care system is a complex network of people, information, technologies, cultural, social, and political processes. But within that complexity are moments where the situation is much smaller, much more contained, where a specific experience and context can play a major role in a patient’s life and wellbeing.



The over emphasis on the vastness of context has left rhetorical scholarship devoid of its inductive history that can be just as valuable. Qualitative health and medical scholarship typically works with small populations; thus, shifting our contextual scale and rhetorical reasoning approach enables scholars to begin to form theories and generalize knowledge on a series of “n=1” cases. PXD holds great potential as a way to gather a number of cases at one time. “Context, then, helps us to better see how information is interpreted, how experience and events are woven together to create knowledge about events, and how those using information relate to one another” (MacPhail, 2014, p. 163).

There will always be tension between different entities who create information for someone else to use. For health care situations, the multiple contexts—those places where patients and caregivers may use the information as well as the contextual beliefs about the information—become difficult barriers to overcome. However, when scaling back context as PXD encourages one to do, technical communicators stand a better chance of creating PEMs (and other materials) that can actually make a difference and answer the contextual problem like that found in Gouge’s study (2016) and the STDs research project.

## EMBODYING METHODS

While proponents of user-centered design (e.g., Albers & Mazur, 2003; Norman, 1988; Redish & Barnum, 2011) have advocated for practical, useful, and customer-focused designs, their definition of customer/user has remained selective, designer-centered, and focused on a typical able-bodied user (Meloncon 2013; Zdenek, 2015). Since many users in health care settings are for the moment at least, not able bodied, PXD incorporates an awareness drawn from disability studies and design (e.g. Pullin, 2009) that user experience design needs to incorporate all types of users and as discussed here, in all types of contexts. Contrary to recent attempts to put the emphasis on the object (Rivers & Söderlund, 2016, p. 134), PXD unapologetically keeps the focus on the embodied user and the way the patient needs to use the object. The reason that health care has attempted to invoke “patient-centered” language and processes is because there is a great need to practice health care that is focused wholly on an embodied patient. Historically, technical and professional communicators have assumed the role of advocating for the humanistic perspective, which is of utmost importance in health and medical contexts. Thus, any approach to usability and designing information must focus on the patient and other people in the process.

To understand the experiences of the patients involved, in-depth biographical attributes and past experiences must be captured before and during the testing of the PEMs. The detailed biographical attributes will guide the research and design teams in creating PEMs that better meet the needs of the users. Technical and professional communicators have longed used the persona as a tool to assist with this sort of audience analysis, and Meloncon (2017) recently expanded personas by arguing for the need to embody the users—think through any physical or mental limitations that may impact the development and use of the information, product or service. PXD’s emphasis is on the experiences of patients and their “first-person experience, thus challenging the medical world’s objective, third-person account of disease. . . .” (Carel, 2008, p. 8). Emphasizing the patients allows their knowledge and expertise to be validated as much (if not more so) than the knowledge and expertise of the doctors and other health care workers. This shifting of established

hierarchies, then, allows for being able to gather appropriate detailed data to be incorporated into participatory design practices. In addition, Meloncon encouraged technical communicators to also consider the contexts of use more critically. In the case study of the PEMs on STDs, the research team completed an iterative audience analysis process that began with research, then persona creation (using the new model set for by Meloncon, 2017), followed by interviews of participants and key stakeholders (e.g., public health manager and a nurse), refinement of the personas, and using the personas throughout the multiple drafts of the documents. This process was one of the successful parts of the research project, and it confirmed that audience analysis research methods should be fully embodied.

Implicit to embodiment is “experience,” and it is a key facet of PXD that needs to be explicated. Usability has always been concerned with the experiences of the users. However, user experience design evolved because of usability’s limited focus on the entire experience of the users, and the limitations of usability methods to capture the complexities of users and their experiences. “Knowing about users’ experiences, then, becomes vital to the process of designing the communication. If we have access to both what is being communicated and what experiences are influencing the receipt of communication, then we can design for experiencing” (Sanders, 2002, p. 2). Experience in this context means ways users have previously interacted and experienced PEMs, as well as their life experiences that may impact the reception and use of those materials. Recent scholarship on methodologies for the rhetoric of health and medicine has foregrounded the importance of gaining more information about the embodied experiences of patients (Angeli, 2017; Meloncon, 2017).

A current example of this is a case study by Renguette (2016). She offered an example of the potential what I am advocating for in PXD. Renguette described her collaboration with a medical animation company and a surgery clinic to create electronically distributed PEMs about a type of surgical procedure. The “software application [was one] that would help the clinic’s patients learn about the pre- and post-surgical lifestyle changes and implications of the procedure before making a decision about whether or not to have the surgery” (p. 366). The write up of Renguette’s study lacks comprehensive details about the process and participation of patients, but it is clear that the qualitative interviews she conducted ensured the language used to describe the procedure could be understood by the patients. But without knowing more details of the research study design, the field is left wondering how to codify the practices that Renguette used. PXD provides a methodological orientation to capture and more importantly, to practice research in health care settings that are more attuned to contexts of use and to embodying usability methods. Limited research has shown that when patients are involved in developing written information, twice as many considered the material to be easy to understand compared to when they had not been involved (Chumbley, Hall, & Salmon, 2002). Two recent studies (Hahn-Goldberg et al., 2016 and Peters et al., 2016) show promise in developing collaborative teams to create PEMs. Smith et al. (2014) have even acknowledged that patients viewed materials created by a professional writer more favorably. To do so, will require expanding the current configuration of methods and theories to design and test information (and technologies), which is discussed in the next section.

## USABILITY METHODS

Traditional usability methods have been used in assessing, evaluating, or creating PEMs. However, in allied health and medical related fields, researchers often rely on two approaches: instruments and/or toolkits or readability formulas. Health literacy instruments and toolkits were created to provide big picture, efficient oversight into the design process, and they are often used as the sole approach to usability (e.g., Hahn-Goldberg et al., 2014; McCarthy et al., 2012) or as a way to guide usability testing (e.g., Hill-Briggs, F., & Smith, A. S., 2008; Jewitt et al., 2016). Additionally, numerous studies have been conducted to assess the readability and suitability of PEMs (e.g., Rhee et al., 2013 as a representative approach and conclusions), which technical communicators know is a measure that should never be used in isolation.

Even when health communication researchers approach evaluating PEMs, they do so through theoretical frameworks (Crook et al., 2015) or much like medical counterparts, through strictly employing readability formulas (Ho et al., 2015). An example of a common item found in these instruments is a call for plain language. Even though a technical communicator would appreciate this inclusion, the field would push back when plain language is reduced to a single readability formula measurement. Thus, there is a need to develop usability methods that can guide health care professionals and researchers to move beyond impoverished and one-dimensional approaches to usability.

Compounding these narrow approaches to usability is the fact that in technical communication, we have not updated methods for usability to account for testing complex, text-based information (whether in print or delivered online). As Rose et al. (2017) recently concluded, traditional think aloud protocols were not conducive to their research because they wanted to be “better engaged with the participant during the study, and to collect data that were nuanced and could facilitate an open discussion . . . rather than to deliver a firm and hard set of metrics” (p. 227). The most expansive look at reader-focused, text-based methods was Schellens and de Jong (1997), but much has changed in twenty years in how readers approach information. Also, Schellens and de Jong’s (1997) usability method, the plus-minus method, has not been used nor tested rigorously, which only underscores the need for current and tested usability methods.

We recognized the lack of adequate methods when we started to plan the project on PEMs of STDs. Reviewing available usability methods compared to our research questions left us wanting a new approach because each one of the existing methods would have been inadequate to gather the types and kinds of information we needed. Much like Rose et al. (2017) concluded, we knew from the outset that think-aloud protocols would not serve our purposes. The main reason existing methods were not adequate was that they did not account for testing both attention and comprehension, which was one of the project’s main research questions. (See de Jong & Schellens, 1997 for an overview of methods that, unfortunately, still stands as the most comprehensive review of reader-based evaluation methods.)

To create new usability methods to be used in PXD work, we found Simmons and Zoetewey’s (2012) “productive usability” a useful starting point. They offered “productive usability as “a refinement of conventional usability approaches,” and “it strives to respect established usability standards while also accommodating the kinds of in-depth and multifaceted explorations that complex

problem solving requires” (pp. 252-253). While Simmons and Zoetewey (2012) focused on environmental civic websites, and citizen knowledge work, the notion of complex problem solving is vital in understanding the need for a user-experience approach that better accounts for context. Their singular focus on traditional usability spaces, that is, websites and web design, come up short for providing a framework for usability that occurs outside of web spaces, but it did inspire us to perform a “multifaceted exploration” to consider and reconsider our research questions and what we were attempting to accomplish. As Simmons and Zoetewey (2012) point out, productive usability gives space to the users to provide input on the way they need and want to use the information rather than simply on ease of use, which intersected with our own insistence of using a participatory design process. Highlighting the qualities of collaboration, productivity and literacy means that productive usability has greater potential to capture the nuance and complexity of user approaches to solving complex problems.

The team decided to modify Schellens and de Jong’s plus-minus method, so ultimately, the project was not only testing the PEMs on STDs but also testing the test method. We were able to modify the method by following the advice presented in the contexts of use and embodying methods section. We also relied heavily on the principles of participatory design and did multiple iterative steps (involving participants, both those fitting the target range for the PEMs, as well as other stakeholders, at every stage). Other than developing a new usability method, this process underscored the need for more innovative usability methods that can account for the complexities of reader-focused, text-based health and medical materials (delivered both in print and/or online).

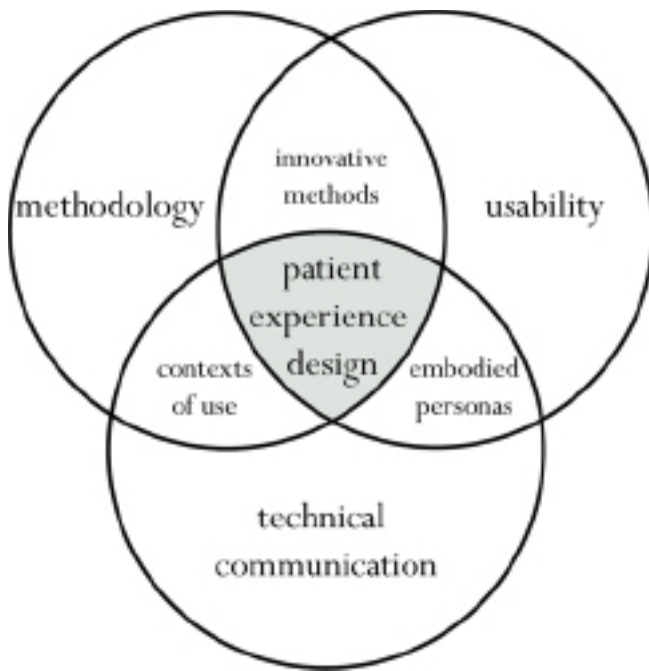
## Implications of PXD

Health information must be timely, accessible, accurate, useful, and understandable. The proliferation of information found online and accessed via mobile devices increases this demand. Thus PXD can be an integral part of a care plan because it can help patients

- understand their own health and treatment
- maintain their own health records
- facilitate care options by participating in shared decision making
- act on the information to potentially improve health outcomes

At its center, PXD focuses on quality of life and perceptions of the patients. This methodological attitude or orientation means the primacy of how information is designed has potential to improve health literacy, health numeracy, and patient comprehension of healthcare information. Patients who can understand, maintain, and facilitate their care more easily could potentially achieve two important goals in healthcare: obtaining better outcomes and/or improving quality of life and reducing health care costs through prevention practices. Both of these goals can be enabled by PXD.

PXD provides a defined path for technical communicators to be more directly involved in health care through the development of PEMs, as well as a variety of other types of information design. The field has long advocated for taking our skills and expertise into new areas, but in this case, PXD provides us the opportunity to better articulate the specialized knowledge we do have in a new arena. Rather than simply calling this movement an extension of technical communication, I encourage technical communicators to think of it



**Figure 2: The domains of knowledge for PXD with the primary concepts**

as the advancement of foundational skills and concepts into a new arena—thus, an ideal articulation of the work that we do.

Part of the impetus for this article was updating and modifying the original conception of PXD, particularly the fact that the original visualization did not adequately capture the ideas and nuance contained in PXD. See Figure 2 for an update.

With PXD drawing on the overarching concept of user experience, it was redundant to keep user experience as a driving factor of PXD. Rather, PXD assumes the characteristics of user experience with an emphasis on the domain knowledges of technical communication, research methodology, and usability. The overlapping areas are the primary concepts of PXD that are drawn from each domain of knowledge. Technical communication has the potential to take existing ideas and build new theories. PXD is one instantiation of this idea, and it brings with it a number of future directions for research.

### Future research

PXD provides a number of opportunities for future research for technical communication and the emerging area of the rhetoric of health and medicine (Meloncon & Frost, 2015; Scott, Keränen, Segal, 2013):

- apply PXD as a methodology in other settings and sites to either prove, disprove, hone, or alter the idea. While we are continuing our research project, which has been used as an example throughout, there are many opportunities within health and medical settings for researchers to work with these ideas.
- hone and further test the concepts of embodying audience analysis methods through personas and participatory design.
- enter into research on health literacy that would bring together PXD and plain language (as a starting place). For example, Mackert et al. (2015) correctly pointed out that there are many

health literacies, and Weiss (2015) exposed the problem that the majority of current research in health literacy is focused on “testing” instruments and assessment tools rather than trying to improve patient outcomes and patient quality of life.

- create and test innovative usability methods designed for health and medical information and settings.

Beyond PEMs, PXD shows great potential as a theory in the area of wearables research. The recent interest in wearable technologies in healthcare (see Gouge & Jones, forthcoming issue of this journal) is a perfect opportunity to put the theories behind PXD into practice. Other than simply creating more usable devices, technical and professional communicators are poised to help put the information from wearables into context. A common concern—and problem—is that the vast amount of information generated by wearable devices is unhelpful or not useful within the frameworks of day-to-day care. PXD would create a specific attention to how to make the information as useful and usable as the interfaces and technologies.

### CONCLUSION

PXD, as a theory building methodology, brings together different domains of knowledge to provide a way to approach research projects that involve diverse stakeholders in diverse health and medical contexts. Thinking of PXD as a way to actually do research, that is, a methodological orientation that asks the field to reconsider contexts of use, and embodiment, while encouraging the development of new usability methods. It also provides specific ways to improve patient engagement. PXD is about solving experience problems in healthcare, specifically the experience of communication and information design. Thinking in these terms means that PXD can encompass print and digital information for diverse audiences across different types of diseases and conditions, and it has the potential to engage patients in more meaningful ways.

Technical and professional communicators can provide important insights into the design of complex information found in most PEMs; thus, they become a site where the field’s expertise can be actualized, as well as offer the opportunity to expand user experience as theory and advance usability as method. In addition, PXD is a methodological “techné—or the productive art of making and adapting knowledge—to study, make sense of, and in some cases suggest improvements to health and medical discourses” (Scott & Meloncon, 2017, p. 6). Using PXD as methodological orientation ensures that technical communicators and other researchers are designing complex information that will allow people the opportunity to help themselves and bring about better health outcomes for themselves and/or their families.

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