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Clarence Maybee
Purdue University, cmaybee@purdue.edu

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Introduction

This chapter discusses using phenomenography to study information experience. Emphasizing the experiential nature of learning, Marton, Runesson, and Tsui (2004, p. 5) made the statement, "Powerful ways of acting spring from powerful ways of seeing." This deceptively simple statement argues for the need for research that reveals the experiences (ways of seeing) of learners. It suggests that our abilities to perform in any number of ways, scholastically, professionally, etc., are informed by how we experience that which we are trying to achieve. Moving students towards experiencing the subject in the way the teacher intends requires knowing how students are experiencing what is being taught (Prosser & Trigwell, 1999, p. 23). This is true for teaching students to use information, just as it is for chemistry, sociology, or anything that can be learned. Emphasizing learning as an outcome of using information, recent research focusing on information experience has been referred to as informed learning research (Bruce and Hughes, 2010; Bruce, Somerville, Stoodley, & Partridge, 2013). Preliminary findings from a current informed learning study into how a teacher and students experience learning to use information in an undergraduate writing course are presented to illustrate the educative benefits of researching information experience. This supports the suitability of phenomenography as a research approach to study information experience (Yates, Partridge, and Bruce, 2012).

Author's perspective on the study of information experience

Many years ago I read The Seven Faces of Information Literacy, which reported the seminal findings of a phenomenographic study of how higher educators experience information literacy (Bruce, 1997). Each of the seven categories reported in the study's findings describes a different information literacy experience: information technology, information sources, information process, information control, knowledge construction, knowledge extension and wisdom. I was skeptical that the categories described in the Seven Faces would be applicable to undergraduate students, who I thought might experience using information very differently from educators. I decided to conduct similar studies to the Seven Faces study, but with undergraduate participants (Maybee, 2006, 2007). These studies aimed to reveal how the students working in an undergraduate context experienced using information to complete

their assignments. Following phenomenographic protocols, I interviewed students, asking questions designed to get them to describe how they used information for this purpose. Then I iteratively examined the transcriptions of the interviews with the aim of categorizing the critical aspects of the students' experiences.

My presupposition that undergraduates might experience using information for their academic work very differently than higher educators turned out to be wrong. As the two studies (Bruce, 1997; Maybee, 2006, 2007) investigated related but different phenomena, that is information literacy and information use, an exact comparison is not possible. However, there were a number of notable similarities between the experiences of the two groups. The four categories that emerged through my analysis revealed that undergraduates in these two settings experienced using information to complete assignments as: using technology to find information, knowing the characteristics of and where to locate quality sources, following an information process, or building a knowledge base. Although there were only four categories, all four are similar to categories identified in the Seven Faces research (see Figure 1). In both studies the categories are hierarchically related, with more complex categories, for example building a knowledge-base, subsuming some of elements of the less complex categories. The knowledge-base category in both studies represents a shift to a focus on the meanings derived from engagements with information, whereas the technology, sources and process-focused categories emphasized the nature of the information being sought or the techniques for handling information.

Figure 1: Categories reflecting higher educator and undergraduate experiences
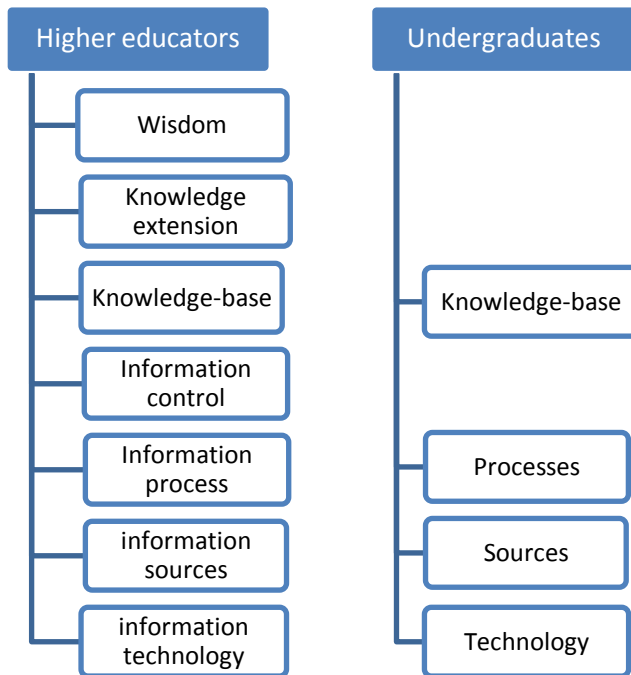
Adapted from Bruce, 1997 (higher educators) and Maybee, 2006, 2007 (undergraduates).

education settings students experience using information in ways similar to educators. More importantly, it provided (along with several other studies, e.g., Edwards, 2006; Lupton, 2004, 2008) a nuanced understanding of the ways that undergraduates experience using information to learn. I have since realized that knowing how our students experience what we want them to learn enables us to see the differences between the students' experiences and the experience that we, as teachers, want for our students. Phenomenography provides the necessary information to empower teachers to teach in ways that broaden our students' experiences, helping them to become aware of aspects of using information that are not part of their current experience.

Improving teaching by studying experiences of learning

Phenomenography was developed in the 1970s by a group of researchers at Gothenburg University, as a way of researching learners' experiences of learning in their courses. In common with other educational research methodologies emerging at the time, early phenomenographers were reacting to methodologies underpinned by positivistic or behaviouristic views, which emphasized an objective stance in which people are separate from the phenomena with which they are engaged (Svensson, 1997).

Referred to as relational, the phenomenographic view is that people experience the world as being comprised of the interrelationship between an individual and a phenomenon (Marton, 1986). Thus, phenomenography offers the concept of constitutionalism, in which people and aspects of the world are seen as interacting, with reality constituted as an internal relation between them (Marton and Booth, 1997, p. 13). Phenomenographers typically adopt a second-order perspective to conduct research investigating research subjects' experiences of the world around them. For example, a phenomenographer would ask, "How do people experience information literacy?" not "What is information literacy?" A distinction of phenomenography from other methodological perspectives is the assertion that there will always be a limited number of ways that people experience the same thing (Marton, 1981). For some this may seem unintuitive, yet there are a substantial number of research findings that support this premise.

In the 1990s, a group of scholars developed variation theory, a theory of learning that reflects what phenomenographic researchers learned from their work in the preceding two decades of research into people's experiences. This marked an important shift in the focus of the phenomenographic community from methodological to theoretical concerns (Marton & Pang, 1999). Over the next two decades, the evolution of variation theory was discussed in four monographs (Marton & Booth, 1997; Marton & Morris, 2002; Marton, F. & Tsui, A., 2004; Marton, 2013). Variation theory is based on the premise that some ways a teacher "handles" a topic—what the teacher says and does to make the students more aware of the topic—have more impact than others on students' ability to learn (Marton and Morris, 2002, p. 133).

Variation theory suggests that for learning to occur, learners must experience variation in the features that are critical to what they are trying to learn, for example, a concept, ability or topic. There are four types of variations:

1. contrasting the thing being learned about with something else (e.g., a journal is not a book);

2. separating parts of the thing being learned about from the whole (e.g., a journal has a table of contents);

3. generalizing different aspects of the thing being learned about or its features (e.g., there are scholarly, trade and popular journals); and

4. fusing the parts that have been separated back together in some way (e.g., the Journal of _____ is a scholarly journal with a rigorous peer-review process). (Marton, Runesson, & Tsui, 2004)

Using variation theory, researchers can study interactions in classrooms to determine if the way a teacher introduces the four types of variations throughout a lesson enables the students to become aware of the critical features in the way that the teacher intends (e.g., Rovio-Johansson, 1999; Vikström, 2008). Phenomenographic research examining classroom lessons maintains a second-order perspective, focusing on the experiences of the teacher and students, however it includes a first-order perspective as well, which reflects the researcher's experience of the classroom interaction. The more recent work of this kind, called learning study (Pang & Marton, 2003), applies variation theory to lesson study, an approach used in Japan to develop effective classroom lessons through repeated trial (Lewis, 2000). Having been used successfully to enhance lessons to enable learning in K-12 environments, learning study has the potential to do the same for higher education.

Information experience research

From the 1960s until fairly recently, research focused on humans interacting with information has typically been labeled as falling under the umbrella concept of information behaviour. Information behaviour has been associated with a cognitive viewpoint which holds that handling information is typically triggered by needs and motives. However, research may explore human interactions with information from other perspectives and the difference between these approaches should be made explicit to promote greater intentionality concerning the concepts underpinning the research (Savolainen, 2007). Two concepts, information experience and information practice, offer alternative ways of understanding and framing information use. Information practice is grounded in a sociocultural perspective, and, as the name suggests, takes practice as the point of departure for studying how people use and understand information. Information practice research also focuses on how information is used within a community as the unit of analysis, whereas information behaviour research focuses on the individual (Lloyd, 2010). Information experience researchers, on the other hand, are interested in how people experience the world, which can be individually or socially constructed, as well as some combination of the two (Marton & Booth, 1997, p. 13).

My own research into how undergraduates experience using information to complete assignments belongs to the growing body of work that uses phenomenography to study information experience. The

Seven Faces of Information Literacy (Bruce, 1997), in tandem with a study conducted about the same time that investigated high school students' information seeking (Limberg, 1999), signified the start of this work. This, and the research that followed, drew on the phenomenographic view of experience to study how teachers and learners in higher education experience using information to learn (e.g., Edwards, 2006; Lupton, 2004, 2008; Maybee, 2006, 2007; Webber & Johnson, 2005, 2006). Typically, this research aims to inform pedagogic practice. For example, Lupton (2008) found music students enrolled in two different undergraduate music composition courses experienced the relationship between information literacy and learning as (a) applying techniques, (b) engaging in an iterative process of discovery, or (c) expressing themselves through art. However, the students in the two classes experienced expressing themselves through art differently. One of the courses emphasized developing techniques and the students gave one performance of their work at the end of the term. The students in this class understood information literacy and learning as applying techniques to express themselves. In the other course, the students presented their works-in-progress across the term. The students in this class understood information literacy and learning as applying techniques in an iterative process of discovery to express themselves. The learning design of the second course enabled students to experience information literacy and learning in a more complex way that included a process of discovery.

Developed from phenomenographic research, informed learning emphasizes learning as an outcome of using information (Bruce, 2008). Much of the current informed learning research is conducted using phenomenographic methods. Informed learning research has focused on understanding how people use information to learn in a variety of contexts, including religious information literacy (Bruce, in press; Gunton, 2011; Gunton, Bruce, & Stoodley, 2012), and health information literacy (Yates, Partridge, & Bruce, 2009). Described in the following section, my current research focuses on developing an understanding of informed learning in formal, higher education settings. This research examines how the interaction between a teacher and learners during a classroom lesson enables the students to learn to use information to understand a topic in a new way (Maybee, Bruce, Lupton, & Rebmann, 2013).

Information Experiences in an Undergraduate Classroom

This chapter has outlined the development of the use of phenomenography to study experience and how that has been applied to the study of information experience. In this section I describe a research project that aims to study experiences of informed learning in an undergraduate classroom. As described previously, informed learning emphasizes using information while learning about something else. The upper-level writing course that was selected for this research used an assignment that met the fundamental

criteria of informed learning, that is, using information and learning about the topic happened at the same time. The topic of the course was language and gender, and the students were expected to learn about writing and research in that context. Over several years, the teacher developed an assignment designed to get the students to adopt a particular approach to research emphasizing a deliberate examination of a sequence of language and gender research that happened over time. The lesson that is the focus of the research described here introduced the students to the term paper assignment, which needed to reflect an understanding of the topic that was derived from the specific way the students used information, which was identifying a seminal piece of research and examining the research that developed in response to that seminal piece.

Methods

This research investigated the question: How do students experience a lesson designed to enable them to learn to use information while simultaneously learning subject content? The specific methods used were similar to earlier phenomenographic research that used variation theory to reveal differences in learners' experiences (Rovio-Johansson, 1999; Vikström, 2008). The data from a semi-structured interview with the teacher prior to the classroom lesson was analyzed to determine the teacher's experience of the object of learning. Then the transcript of the video observation of the enacted lesson was analyzed using variation theory to identify the critical features of the object of learning and the types of variations (contrast, separation, generalization and fusion) made during the lesson. After the lesson, semi-structured interviews were conducted with five of the fifteen students to determine the students' experiences of the object of learning.

The teacher's experience of the lesson

The transcripts of the semi-structured interview with the teacher prior to the lesson were analyzed to determine the teacher's experience of the lesson, which is referred to as the intended object of learning. Working from an assignment sheet, the teacher planned to explain the difference between the final paper assigned in this course and a research paper typically assigned in other undergraduate courses. She described the process of completing a typical paper as:

> …you go out on the internet, into the library, you find sources on a topic, develop a thesis, then you find evidence to support it and then you write a long account of it with plenty of notes. (Teacher, Pre-lesson interview)

Whereas in the assigned paper, a student should be:

> … reading widely, then coming to some kind of an understanding of the reading in which you think of all the authors that you are looking at as participating in a conversation, and then developing a thesis. (Teacher, Pre-lesson interview)

The teacher also planned to draw students' attention to proper citation, as well as identifying citation patterns to follow the research development of a language and gender topic. During the second half of the lesson, the teacher planned to introduce two texts (i.e., Bucholtz, 2004a, 2004b), which were to serve as a scholarly version of what the students should aim for in their own papers. Using the model, the teacher planned to make the students aware of the parts of the assigned paper, which included reference to a seminal language and gender text, claims made for that text, and structural elements, such as layout.

The researcher's experience of the lesson

The analysis of the observed classroom lesson results in a description of the theoretical understanding, or researcher's experience, of the object of learning. As intended, the teacher repeatedly contrasted the final paper she wanted the students to write with the typical research paper. The teacher also described features of the assigned paper. When she did this, she varied the feature of thesis, generalizing it as a "very narrow thesis about the sequence of articles" related to a seminal language and gender text. The class had spent time earlier in the semester discussing what makes something seminal. She also separated out the feature of a seminal text as well as the research that developed in response to it, referred to as a research trajectory. The teacher separated out the feature of topics, when she asked the students to identify potential paper topics. Different students offered examples, such as hermaphrodites, and sexuality and gender in relationship to language use. The teacher then offered her own topic examples, such as the role of "interruption" in discourse as a concern of language and gender scholars. Unlike the students, however, the teacher fused the critical features of topic and research sequence when she described interruption, by identifying how the topic had been reappraised over time through various research efforts.

The second half of the lesson focused on two essays assigned to be read for that day's class (i.e., Bucholtz, 2004a, 2004b), in which language and gender-focused research was related back to the introduction of a seminal work in the field. This was to serve as a model for what the students were to undertake in their own papers. The teacher contrasted the essays with the assignment by identifying them as scholarly versions of the students' own efforts. The model essays were from a monograph edited by

Bucholtz, which included a re-publication of Language and Women's Place, the seminal piece by Robin Lakoff (2004) originally published in 1975, along with writing by other authors responding to the Lakoff text. The teacher separated out the structural elements used by Bucholtz in her essays, which tied together the various responses to Lakoff. The teacher also varied the critical features of strategies for making claims and developing themes from the scholarly responses to the seminal text, by having the students identify the different kinds of strategies used by Bucholtz.

The students' experiences of the lesson

The findings related to the students' experience of the lesson outlined here have been reported in more detail in an article in Library and Information Science Research (Maybee, Bruce, Lupton, & Rebmann, 2013). Here the focus is limited to providing an overview of the critical features discerned by the students. Based on this analysis, three categories emerged reflecting the different ways that students experienced the informed learning lesson:

New Way of Learning - students experienced the lesson as presenting a way of conducting research and writing that would lead to new insights and understandings.

Imitating Example Essays - students experienced the lesson as offering techniques for completing the assigned paper.

Instructions for Any Assignment - students experienced the lesson as relating generic instructions about the steps involved in conducting research and writing.

The critical features varied in the classroom lesson (the type of paper, a research sequence, a thesis that makes a claim about a research sequence, etc.) are the parts of the object of learning that students needed to become aware of to experience it in the way the teacher intended. The critical features discerned define the nature of each category (Table 1). It should be noted that the categories do not reflect individual students, but represent the collective experiences as analyzed and described by the researcher. The five students interviewed discerned a selection of the critical features.

Table 1: Critical features present in the lesson and in students' experiences

Critical features	Informed Learning	New Way of	Imitating	Instructions for
Themes as structural and unifying elements	●	●		
Research Trajectory	●	●	●	
Claims made for the seminal text	●	●	●	
Type of academic paper, e.g., scholarly model, standard	●	●	●	●
Critique as an element of persuasive argument	●	●		●
Organizational elements	●	●		●
Seminal text as feature of paper	●	●		●
Thesis as feature of paper	●			●
Paper topics	●			

(Maybee, Bruce, Lupton, and Rebmann, 2013)

Of the nine critical features varied by the teacher during the informed learning lesson, seven of them were discerned by students experiencing the object of learning as a New Way of Learning. These students compared the type of paper the teacher wanted them to research and write with a typical research paper. They also focused on the *research trajectory* as a way of understanding a language and gender *topic*, and identified the *seminal text* as a central element of this kind of paper. In addition, they discerned the *claims* made for the seminal text, the *themes* that could be drawn from an analysis of the research over time, *organizational elements* of this kind of paper, and *critique* as an element of persuasive argumentation. These students experienced the object of learning as being focused on engaging with information sources to understand and make claims about a language and gender topic:

> …by looking at this seminal work [seminal text] and three or four more essays that follow it [research trajectory], it's supposed to be a way of questioning the connections between them, where the conversation is going, what makes it controversial, what makes it worth talking about [claims]. (Student 4, Interview)

The students experiencing the informed learning lesson as Imitating Example Essays discerned only three of the critical features that were varied by the teacher during the classroom lesson: the *research trajectory*, the *claims* made for the seminal text, and the *type of academic paper*. As exemplified in the following quote, students experiencing the object of learning in this way

understood the lesson as focused on techniques for identifying and communicating a research sequence:

> Bucholtz takes this one text and then shows its importance and goes through the steps of showing why it's important and why it's still relevant today. I guess maybe 30 maybe years later, 35 years later, and then show how it influences the later texts, and that's exactly what we're doing with another text. (Student 3, Interview)

As with the other two categories, students who experienced the lesson as Instructions for Any Assignment also focused on the type of academic paper presented by the teacher during the lesson. However, instead of varying it with the standard paper or scholarly-version of the assigned paper, it was held invariant, suggesting that no difference was perceived between the assigned paper and the standard academic paper. Students experiencing the object of learning in this way focused on generic aspects of using information to research the paper:

> …let's say you read 20 things, you should use like 10, and I mean that in the sense of you use about half, but you are going to read a lot more than you are going to end up using. Just you have a really wide base of knowledge that will then support your thesis, things that go against it, and then choose the best ones to go into the paper. (Student 1, Interview)

Students experiencing the lesson as Instructions for Any Assignment also varied the critical features of *critique* as an element of a persuasive argument, *organizational elements*, the *seminal text* as a feature of the paper, and the *thesis* as feature of a paper.

Using experience to improve learning

Although the teacher's intentions for the lesson aligned well with what was enacted in the classroom, the students had various experiences of the lesson. The students experiencing the lesson as a New Way of Learning discerned more of the critical features of the object of learning that were intended by the teacher. The students experiencing the lesson as Imitating Example Essays were not focused on understanding a language and gender topic in a new way, but rather were aware of critical features they related to techniques that would enable them to meet the requirements of the

assignment. The students experiencing the lesson as Instructions for Any Assignment discerned critical features associated with the organization of the paper, but were not aware of the paper as being different than a typical research paper. While it is possible the students will become aware of different critical features as they work on the assignment, the findings from this research suggest a way that the lesson could be changed to enable the students to discern more of the features the teacher intended for them to see.

An intention of the lesson was to make the students aware of the differences between a paper that offered an understanding of a language and gender topic as the result of research that took place over time, and a typical academic paper. Among other things, the students needed to be aware of how the critical features of a *research sequence,* and language and gender *topics,* interrelate in the paper the teacher intended them to research and write. This was briefly introduced in the enacted lesson when the teacher provided the example of *interruption* by describing how the topic evolved through research. To enable more of the students to become aware of the two features and how they need to come together in the assigned paper, the teacher could be more explicit in separating the two features and fusing them in examples to show how a language and gender topic can be understood as a seminal idea that is elaborated on through additional research over time.

Conclusion

In higher education, studies adopting an information experience perspective have yielded important insights for informed learning design. This was exemplified in the findings from my study of undergraduates learning to use information to understand a language and gender topic, which suggests how the teacher might vary the critical features of the object of learning to influence how students experience the lesson. Phenomenography and variation theory proved useful methodological tools to study the intended, enacted and lived experiences of using information to learn. Studies like these add to our body of knowledge, explaining how information is used to learn in a behaviour learning environment. Future information experience research may also want to utilize learning study methods, which typically involve researchers and teachers collaborating by using variation theory to iteratively enhance a lesson in order to enable intended learning outcomes (Pang & Marton, 2003). Researching information experience allows us to make sense of the experiences of learners and teachers, providing the information needed to better address information literacy in various contexts.

In other words, understanding information experience is necessary to inform learning designs capable of enabling the "ways of seeing" students need in order to act powerfully in both their academic and professional lives (Marton, Runesson, & Tsui, 2004, p.5).

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