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PHENOMENOGRAPHY: ALTERNATIVE RESEARCH APPROACH FOR STUDYING THE DIVERSITY OF USERS' UNDERSTANDINGS

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Abstract

This essay aims to introduce an alternative methodological approach, phenomenography, for studying users of information systems. Phenomenography can reveal the variation in users' views. We outline the use of phenomenography with the help of our hands-on experiences from two empirical studies: in the contexts of e-privacy and virtual product prototypes. We also discuss two common misinterpretations that we have encountered when using phenomenography. One misinterpretation is related to data collection and analysis, the other with the research result. The essay provides support for multidisciplinary methodological plurality in the information systems field by suggesting a research approach from a related field, namely that of education.

Keywords: Users' Understandings, Information Systems Science, Research Methods, Interpretative Studies, Phenomenography.

1 Introduction

The need to understand humans and their actions is generally accepted in the information systems (IS) field (e.g., Walsham, 1993; Klein and Myers, 1999). In the context of information and communication technology (ICT), a human is usually called the user based on the user's relationship to technology (e.g., Greenbaum and Kyng, 1991; Yoo 2010). Trying to find out about users' understandings of ICT is common to all human-centred design strategies. That is so also in the Scandinavian approach to IS development, which highlights the central role of user understanding in improving work practices (e.g., Bjerknæs and Bratteteig, 1995; Mathiassen and Nielsen, 2008). Our essay follows the Scandinavian tradition in that our motivation is to empower non-professionals in their roles in relation to IS. However, instead of studying individual end users at work, our essay is related to studying their technological understandings outside strictly organisational context.

In the IS field, the use of technology is commonly studied with the *technology acceptance model* (TAM). TAM states that users accept and start to use new technology when they perceive that it is useful and easy to use (e.g., Davis et al., 1989). Another kind of conceptual tool for understanding IS users' views is *technological frames* (Bijker, 1995). Technological frames are a subset of organizational frames and concern the assumptions, expectations, and knowledge used by individuals to understand technology in organizations (Orlikowski and Gash, 1994). The discussion about users' understandings is also present in social sciences as *technology domestication*, which is an analytical tool that helps to illuminate the process by which users make new technology their own (Silverstone, 2005).

TAM, technological frames and domestication of technology all offer valuable ways to study users' understandings. Our focus, however, is to reach beyond conceptual tools, such as those three, and seek richer ways to capture users' understandings of technology. There is a need to penetrate the aspects of users' understandings that go beyond purely task-oriented and cognitive approaches.

In this essay **we introduce an alternative methodological approach, phenomenography, to study users of IS**. The aim of phenomenographical study is to find out about the diversity of people's understandings. The results of it are presented as a categorization of alternative conceptions (Marton and Booth, 1997).

Even though the roots of phenomenography are in educational studies (Marton, 1981), it has also been used to study learning in IS-related research. There are studies about how students view learning in programming, as learning experience and motivation for studying computer sciences (e.g., Berglund and Eckerdal, 2006), and in learning related issues, as moral conflicts in enterprise-cooperative IS project course (Vartiainen, 2010). Learning is also studied from educators' point of view focusing on practice of teaching (e.g., Carbone et al., 2007) and ICT/IS in teaching (e.g., Ben-Bassat Levy and Ben-Ari, 2009). Furthermore, educators' conceptions about students are studied with phenomenography (e.g., Kinnunen et al., 2007).

Although phenomenography has mainly been used in the IS field for studying learning, we have found that it is a useful approach in studying IS users' concepts as well. Here we have used phenomenography to study users' understandings in the contexts of *e-Privacy* and *Virtual Product Prototypes* (Kaapu and Tiainen, 2009; Kaapu and Tiainen, 2010). For this essay, our two empirical studies provide hands-on experiences about how to study users' interpretations. With the help of phenomenography we are able to show variations in users' conceptions about the studied phenomenon. Although we find the chosen research approach useful, we have quite regularly encountered misinterpretations about the approach. To address this issue, we illustrate our experiences about using phenomenography by looking at two *common misinterpretations*, and we discuss how a phenomenographer can overcome the problems.

This essay introduces phenomenography to IS research for studying users' technological understandings. In Section 2, we outline phenomenography as a research approach, also by comparing

it to methods of the same kind: phenomenology and ethnography. In Section 3, we briefly describe our use of phenomenography in the contexts of e-Privacy and Virtual Product Prototypes. In Section 4, we discuss two common misinterpretations about phenomenography, namely that it is a tool for lazy researchers and that categorization of conceptions is not the research result. In Section 5, we conclude the essay by pointing out that use of phenomenography provides an alternative and useful way to explore questions about users' understandings.

2 Phenomenography Compared to Phenomenology and Ethnography

Our essay focuses on using the phenomenographical approach to study users' understandings of technology in the IS field. In this section, we describe the main idea of phenomenography by outlining it briefly and then comparing it to two other methods, namely phenomenology and ethnography, which have research targets similar to those in phenomenography.

2.1 Phenomenography

The development of phenomenographical research approach was begun in the late 1970's by Professor Marton's educational research group at the University of Gothenburg, Sweden (Marton, 1981). Phenomenography is a qualitative, empirically based research approach that aims to interpret, describe, and categorise how a phenomenon is understood by a group of informants (Marton and Booth, 1997).

Phenomenographical data collection is usually based on open-ended interviews. As both data collection and its analysis are time-consuming, the number of informants is typically kept low: 20 or so is a common number of individuals interviewed in phenomenography (Sandberg, 2000). The aim is to get to know all alternative views (Richardson, 1999), and because the number of these cannot be known before some of the collected data has been analyzed, the collection process continues until a saturation point is reached (Marton, 1981). Saturation point means that the same themes continually emerge, and additional interviews do not uncover any new themes.

The process of phenomenographical data analysis is iterative and comparative. The data is continually sorted and resorted, and comparisons between the data and the developing categories of description, as well as between the categories themselves, are constantly under way (Marton and Booth, 1997, Pang, 2003). These categories are the primary outcomes and logically related to one another, typically by way of hierarchically inclusive relationships (Marton and Booth, 1997). The source of variability between different categories of description is known as "referential and structural components" of variation. The referential component describes what the phenomenon means in everyday language and the structural component refers to a deeper level of phenomenal meaning (Marton and Booth, 1997). The analysis starts from individual views, then forms hierarchies of conceptions and finally reaches more collective understandings (Renström, 1988).

2.2 Phenomenography and Phenomenology

While Marton (1981) has mainly presented phenomenographical ideas, others have implied that phenomenography is the same as phenomenology (e.g., Gibbs et al., 1982). Marton (1986, 1988) agrees that there are similarities: both phenomenographical and phenomenological research are relational, experiential, content-oriented, and qualitative.

Phenomenology seeks to determine the essential properties and structures of consciousness through systematic reflection (Husserl, 1913/1931; Schutz, 1972). Phenomenologists attempt to capture details of lived experiences. They often present data in a relatively raw form since the aim is to maintain authenticity. Instead of employing that relatively raw form, phenomenographers aim to form hierarchies of conceptions and frameworks of thought (Marton and Booth, 1997).

According to Marton (1981), phenomenology is a philosophical method that is directed towards the pre-reflective level of consciousness. This distinctive level of consciousness is not used in phenomenography. Phenomenographers try to describe relations between the individual and various aspects of the world around them (Marton and Booth, 1997; Richardson, 1999). A reason for this, according to Marton (1988), is that interviewees “will hardly be very anxious to maintain the distinction when they are telling us about their experiences” (Marton, 1988 p. 194). A more fundamental point made by Marton and Booth (1997) is that both experience and conceptualization are of an intentional nature: they should be accommodated within the same categories of description.

Marton (1981) states that there are no such things as “essences” (used in phenomenology, e.g. Schmitt, 1967), instead there is “an infinite set of possible perspectives” (Marton, 1981 p. 12). However, Marton has said that there usually is a relatively limited number of qualitatively different ways of experiencing something, and the goal of phenomenography is to characterize variations in experience and the architecture of this variation (Marton and Booth, 1997 p. 117).

2.3 Phenomenography and Ethnography

Some academicians have argued that phenomenography is just a loose form of anthropology. Ethnography denotes the general study of cultures; more precisely, it refers both to the method of fieldwork through participant observation and to the written accounts produced by anthropologists of the cultures involved (Van Maanen, 1996).

Marton (1988) agrees that there are many basic assumptions that phenomenography shares with ethnography. Therefore, there is the danger that phenomenography could be used, wrongly, to describe work based on very naive ethnographical interviewing (e.g., Francis, 1993). However, Marton (1988) points out that there are important differences between these two approaches in their “foci of interest” and their “theories of description”. Marton himself never tried to assimilate phenomenography to ethnography (Richardson, 1999).

Ethnography implies the analysis of social processes by involvement in day-to-day experience (e.g., Hammersley and Atkinson, 1995). Phenomenographical researchers often are members of academic staff of the educational institutions where their participants study. This is generally quite fortuitous and just reflects the tendency of educational researchers to recruit samples of participants where it happens to be the most convenient method (Richardson, 1999) rather than being due to any genuine commitment to experience the same educational processes as part of the context. Attempts have been made by phenomenographers to address this issue in fields other than IS by letting the participants do something tangible that forms a context and then discuss this activity during the interview (Boustedt, 2009). The idea of role-play has also been used in the previous literature (Boustedt, 2009). Still the idea is to bring the context for interviews, not to be involved in day-to-day experiences as in ethnography.

The aim of the phenomenographical research is to describe qualitatively different ways of experiencing various phenomena (Marton, 1981). While ethnographical research can be seen as the first-order perspective research, phenomenography focuses on the second-order perspective, that is, the researcher focuses on people’s views of the phenomenon (Uljens, 1991). In second-order perspective study (as phenomenographical studies) all understandings are meaningful to report, and one should not ponder over their "rightness". In this sense, the objective of phenomenographical research is to reveal the inherent variation in people’s views.

3 Our Hands-On Experiences on Phenomenography

We have used phenomenography to study IS users’ technological understandings in non-educational context, which is a new applied field for phenomenography. Next we outline two of our studies briefly: *e-Privacy* (described in more detail in Kaapu and Tiainen, 2009) and *Virtual Product Prototypes* (Kaapu and Tiainen, 2010).

3.1 Studying Users' Understandings of e-Privacy

The motivation to study *e-Privacy* was that early studies had produced contradictory findings about users' fears related to e-commerce and e-privacy (e.g., Liu et al., 2005 vs. Cheung and Lee, 2006). So we sought the explanation for this from the users' point-of-view. We used interviews to penetrate users' understandings of the issue (see Table 1).

We identified five objects in users' conceptions (Kaapu and Tiainen, 2009):

- (1) **use and misuse of customer information,**
- (2) **monitoring consumers,**
- (3) **threat of spam,**
- (4) **danger of hackers and viruses, and**
- (5) **risk with payment.**

The five objects are the referential aspect of the interviewees' view. They show *what* the objects the interviewees talk about when they describe their view on e-privacy are. Only one object, use and misuse of customer information, contains both positive and negative sides of privacy; all other objects of privacy are regarded as rather negative. (Kaapu and Tiainen, 2009.)

The other analyzed aspect is the *how* aspect, which illustrates the structural aspect of the interviewees' conceptions. Also for this aspect we identified five components as objects which depict the users descriptions about them. Examples of them are (Kaapu and Tiainen, 2009):

- (1) **products**, e.g., a consumer order of a product,
- (2) **technology**, e.g., the systems that deliver the product to the right person,
- (3) **societal norms**, e.g., the expectations (trust and fears) towards a well-known vendor or an unknown foreign vendor
- (4) **consumer him/herself**, e.g., the consumer may commit an error when writing the order, and
- (5) **fellow men** (means people close to), e.g., there may be a family member watching over the consumer's shoulder.

The final result of this *e-Privacy* study is a categorization which is created by combining the objects and components. The categorization consists of a total of 25 privacy conceptions (i.e., five objects * five components). From the collected data, we could find interview quotations that discussed each object and component (e.g., quotations describing monitoring of consumers and technology; risks with a payment and societal norms etc.). (Kaapu and Tiainen, 2009.)

In phenomenography the world is described the way informants see it. However, some of the conceptions can be totally unrealistic and against the current scientific knowledge about the phenomenon. For example, one of the interviewees quoted in *e-Privacy* paper was wondering whether

E-Privacy	
RQ: How do users understand privacy in e-commerce?	
Technology	Internet <i>Common interfaces of e-commerce such as e-banking and e-shops</i>
Participants	22 interviewees: - aged between 25 and 66 years - 13 females and 9 males - different backgrounds
Data Collection	Individual interviews: what is e-privacy?



Table 1. *e-Privacy - data collection (Kaapu and Tiainen, 2009).*

somebody, through the Internet, could know when the ink was running short in her printer. The example illustrates how consumers' unjustified fears might affect their judgement. Thus, unrealistic statements forming part of (some) consumers' views on the phenomenon, need to be analysed as well in order to understand the variety of consumers' thought-models. (Kaapu and Tiainen, 2009.)

In the *e-Privacy* study, the earlier research findings on consumers' fears about e-privacy were contradictory. Our user-centered study explained one reason for that, namely that consumers' fears are situated. From the methodological point of view, the *e-Privacy* study shows that phenomenography can be used to strengthen the user-centered approach by focusing on users' understanding of the ICT tool or use context.

3.2 Studying Users' Understandings of Virtual Product Prototypes

Electronic shopping and customised products are the rising issues at the moment, and virtual prototypes seem to be effective tools in that field. Although the field is studied to a reasonable extent (e.g., Jiang and Benbasat, 2007), there are still lots of unknown issues, especially from the customers' point of view. We have investigated how users understand 3D virtual prototypes presented in an immersive walk-in virtual environment (VE). In our *Virtual Product Prototypes* study, we showed furniture prototypes in a virtual apartment, a logical place for that. (Kaapu and Tiainen, 2010.)

Whereas in the *e-Privacy* study we just interviewed the informants, in the *Virtual Product Prototypes* study we took them to a VE to provide them with experiences of virtual prototypes. We then interviewed them. Data collection is described in more detail in Table 2.

As in the *e-Privacy* study, also in the *Virtual Product Prototypes* study we arranged the informants' conceptions into hierarchical categories. We also continued the use of "forms of thinking", which includes all the categories an informant uses in his/her description of virtual prototypes. The identified forms are (Kaapu and Tiainen, 2010):

- Form I: a picture of a product via new technology**, which focuses on technology development: the interviewees concentrate on the quality of presentation technology and other technology-centered issues.
- Form II: a separate product**, where a person thinks of and evaluates separate products, ignoring technological issues as well as the room space and its interior.
- Form III: a product in its context**, which is the highest form as it connects the products to their context – in our case furniture to an interior.

Phenomenography is less appropriate for studies where you seek to make knowledge claims about an objective reality, and more appropriate for studies (such as our studies of *e-Privacy* and *Virtual Product Prototypes*) where you want to make knowledge claims about how individuals interpret

Virtual Product Prototypes <u>RQ: How do users understand virtual product prototypes?</u>	
Technology	An immersive walk-in VE <i>Prototypes of furniture presented in VE</i>
Participants	20 test users: - aged between 20 and 73 years - 9 females and 11 males - from different backgrounds
Data Collection	VE visits and interviews after the visit



Table 2. *Virtual Product Prototypes - data collection (Kaapu and Tiainen, 2010).*

reality. Also, phenomenography is more appropriate in cases where there is a need to study people's understandings as a multilevel construct, that is, the researcher keeps an eye on the whole as well as on its parts (e.g., Burton-Jones and Gallivan, 2007).

Burton-Jones and Gallivan (2007) mainly refer to organisational context, where multilevel means studying employees, managers, etc. objects in an organizational hierarchy. The term multilevel when used in phenomenography, as in our study of *Virtual Product Prototypes*, may also mean an arrangement where we start from the individual users' interpretations as the bottom level and continue to higher levels where collective levels of understandings are created.

The phenomenography's educational background is present in using the approach to study users' understandings. When examining the phenomenon from the second-order perspective, it highlights users' learning processes. For example, in the *Virtual Product Prototype* study the interviewed consumers have looked around them when using e-commerce services, they have seen some systems and available services and they know how to buy furniture in traditional or e-commerce shop. If they had never heard or seen a computer and e-commerce interfaces, it would not have been so apparent to them what virtual presentations of furniture mean in the first place. If they had never bought furniture, they would have understood furniture presentations differently. They have many prevailing interpretations. We understand that much of this process is about individual learning.

In the *Virtual Product Prototypes* study, the use of phenomenography allowed informants to tell about their experiences in their own words, and in the analysis process it was possible to have several kinds of pictures of informants' understandings about virtual prototypes. Furthermore, it was also possible to spot informants' expectations in their descriptions. (Kaapu and Tiainen, 2010.) In this way, phenomenography merges research and praxis, and thus the informants' answers are not disconnected from the context. In the *Virtual Product Prototypes* study, the praxis was more present than in the *e-Privacy* study; we were able to observe the test uses and became more aware of what the informants were talking about in the interviews.

This kind of result than in *Virtual Product Prototypes* study can be understood as theory building (e.g., March and Smith, 1995). In general, theory answers a human need to make sense of the world. One characteristic of the IS field is the use of many theories borrowed from other disciplines (Baskerville and Myers, 2002). Although importing theories from outside the discipline is often valuable, we suggest that phenomenography could be used to build theories from within the IS field itself.

4 Two Common Misinterpretations of Phenomenography

Above we have described briefly how we used phenomenography, originally an educational research approach, to get a better idea about the diversity of users' understandings in a non-educational context. In what follows, we discuss the two common misinterpretations we have encountered: one of them is related to the data collection and analysis, the other one has to do with the research result.

4.1 Misinterpretation 1: For Lazy Researchers

The first common misinterpretation is that phenomenographical research is very easy because the researchers do not have to do any prior work leading to it. It is assumed that researchers "just go to the field, ask questions, and report answers." This misinterpretation is related to going to the field, open-minded and without theoretical hypotheses to test, to give space to informants' own conceptions and views (Marton and Booth, 1997).

In phenomenographical interviews, the interviewer empowers the informants by listening to them carefully and respectfully, and allowing them to label the world (and its constituents) in their own terms. This also requires that the interviewer use the language of the informant: it must be figured out beforehand which terms the interviewer is allowed to use and which must not be used. In the beginning of data collection for *e-Privacy* and *Virtual Product Prototypes*, the interviewer used

general terms while making notes of the terms the informants used. For example, if a test user used technical terms (e.g., pixel) during his/her VE test use, the interviewer could use them later in his/her interview.

As the target in phenomenographical interviews is to get an understanding of the interviewees' conceptions, there is a common misassumption that phenomenography requires that the researcher enter the field without any knowledge of prior research. In fact, in the interview situation the interviewer uses his/her knowledge to choose the interesting parts of the interviewees' narration and expands the discussion about them (Tiainen and Koivunen, 2006). One area where the interviewer's knowledge can be increased is the area of relevant research findings. If that is lacking, the interviewer might ignore a relevant and/or novel theme in the interviewee's narration. When penetrating through the richness of the interviewee's description, human behaviour is unravelled in a way that takes into account the physical and social context, and also the actors' intentionality (Schultze and Avital, 2011).

Intentionality means also that the interview situation affects what people say in the interview. The influence comes partly from the expectations of what an interview situation will be like and how one is expected to behave in it. The relationship between the interviewer and the informant also influences the situation and therefore also the gathered data. Researchers can work to improve their interviewing skills through self-reflection and with the help of others, including friends, colleagues and supervisors (Walsham, 2006). We followed this guideline in our *e-Privacy* and *Virtual Product Prototypes* studies. Before the test uses and interviews took place, we practiced interviewing in our research group and organised some pilots to ensure that our planning would work in practice.

One tactic to reassure the interviewee at the start about your purpose and about confidentiality is by having the researcher do most of the talking for the first few minutes. This makes the interviewee relax, and will improve the quality of the interview (Walsham, 2006; Myers and Newman, 2007). For example, in the *Virtual Product Prototypes* study we didn't conduct the interviews and the VE tests on the same floor. While the informant and the interviewer were still on their way to upstairs, the interviewer started talking about her own personal background. While doing that the researcher had to be extra careful not to affect the informants' understandings.

The phenomenographer must not be lazy in analyzing the data, either. One related phenomenographical problem is that the literature of phenomenographical approach (e.g., Marton, 1981; Marton and Booth, 1997) gives little guidance on the phenomenographical analysis in practice. The collected data can consist of several hundreds of pages. The challenge in phenomenographical analysis is the same as in all interpretive methods: the researcher needs to find out the elements and dimensions which structure the empirical material. The analysis is done by reading the whole material over and over, in some readings focusing on the whole, in some to individual interviews, and in some to the categories.

Creativity and many trials were required and the researcher had to be critical towards his/her own results when analysing, without strict guidelines, the collected data of the *e-Privacy* and *Virtual Product Prototypes* studies. Another challenge in conducting a multilevel phenomenographical study is related to how to move from one analysis level to another. In the phenomenographical literature, there seems to be different approaches to moving from the surface to deeper layers (Webb, 1997). The researcher has to create linkages between the users' different individual understandings and the levels of interpretations. At the same time, the researcher should avoid studying levels too far apart because that may lead to discontinuity between individual and collective levels (Renström, 1988). We found this a complicated question since informants naturally have several approaches, some approaches being preferred over others depending on the informant. This means that an informant may be referred to in more than one of the formed categories.

4.2 Misinterpretation 2: No Result – Just Categories

In the *e-Privacy* and *Virtual Product Prototypes* studies we found phenomenography to be suitable for studying users' understanding. In those kinds of studies, the result is a categorization of the alternative ways of understanding the studied phenomena. However, when presenting the results in the IS field, some reviewers have claimed that a categorization of conceptions shouldn't be regarded as a result. Nevertheless, in phenomenography the categorization itself is a research result (Marton and Booth, 1997).

Categorization as a result consists of some generalised findings, i.e., making sense of the world (which was the target in our *e-Privacy* study). When the result is a categorisation, it does not just describe the studied situation but somehow, in a more general way, helps to understand other situations (of the same kind), as well.

When a form of thought is a research result (as in our *Virtual Product Prototypes* study), it is on an even more general level than categorization. It is easier to accept as a research outcome, as it is more like a direct step in theory building. According to March and Smith (1995), one possible research output is a model (of the studied phenomena). A model can be viewed as a set of propositions or statements expressing relationships among constructs. The forms of thought model represents this kind of result.

The research (and research results) alternatives have been topics of discussion in the IS field at least for two decades (e.g., Walsham, 1993). Before that, IS research was conducted within the research paradigm of natural sciences, where the target of research is to create theories and test them. However, one target of IS research is to create IT artifacts (Orlikowski and Iacono, 2001). Thus it is a design science, in which the research outputs are constructs, models, methods and installations (March and Smith, 1995).

During last years, the research paradigm in the IS field has changed (or at least expanded), so that, besides natural science, alternative views of science are accepted. One of these views is produced by interpretive research, the targets of which can be examined in the framework presented by Deetz (1996, see Figure 1). Deetz proposed two dimensions for interpretive studies. One of them describes *the origin of concepts and problems*. The opposite ends of these are known as local (the concepts and problems come from practical situations) and elite (the concepts and problems are taken from scientific discussions). Phenomenography aims to find out how individuals view a phenomenon, so the origin of its concepts should be local in Deetz's (1996) classification. The other dimension in Deetz's (1996) classification focuses on *the type of the result*, consensus (the dominant view) or dissensus (space to alternative views). In phenomenography the variation of conceptions is made visible (i.e., intentionality), and thus it presents alternative views. In Deetz's (1996) classification, phenomenography is located within dialogic studies, as its relation to dominant social discourse is dissensus and its origin of concepts and problems is local/emergent.

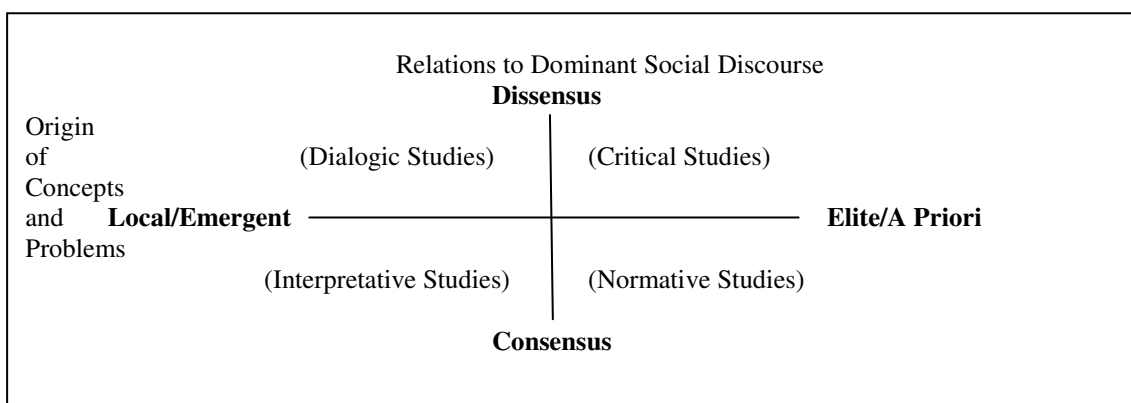


Figure 1. *Contrasting Dimensions of Studies (Deetz, 1996).*

As all the new research methods do not have agreed principles for testing the validity of formed results, Klein and Myers (1999) created seven principles for conducting and evaluating interpretive field studies in the IS field. It is possible to use them in the evaluation of phenomenographical studies which do not have their own validation principles.

One of the principles by Klein and Myers (1999) is *The principle of abstraction and generalization*. It states that the target is to create abstract categories, develop concepts, and depict a rich view (Klein and Myers, 1999). This principle is exactly the same as the target in phenomenographical studies. In the context of interpretive IS studies, a categorization of users' interpretations is a research result.

The validity of this type of research is drawn from one or more cases that do not depend on the representativeness of cases in a statistical sense (Klein and Myers, 1999), "but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them" (Walsham, 1993 p. 15). Klein and Myers's (1999) principles for conducting and evaluating interpretative studies are useful also for phenomenographers, to ensure the quality of research and justify categorization as a research outcome.

5 Conclusions

In this essay we have introduced phenomenography for studying users' understandings via:

1. Previous methodological literature
2. Our studies of *e-Privacy* and *Virtual Product Prototypes*
3. Misinterpretations of "Lazy Researcher" and "No Result – Just Categories"

These are the three different viewpoints through which we have presented the key points of the phenomenographical research approach. By combining all three, that is, methodological literature, hands-on experiences in our studies and misinterpretations, we believe we have made phenomenography easier to understand.

Our work shows that phenomenography provides an alternative way to explore questions about users' technological understandings. Originally, phenomenography was used in educational studies, where the emphasis is often on the architecture of conceptions to detect differences in people's deep or surface learning (Marton and Booth, 1997). Based on the results of these studies, teachers can, for example, improve their teaching (Pang, 2003).

The emphasis is different in IS context. We applied phenomenography to get a good idea about the diversity of IS users' understandings. On one hand, when IS researchers study users' views on a system or its element, there is no need to evaluate the correctness of prevailing conceptions. On the other hand, the variation in the users' interpretation is worth studying. A better understanding of users' views will improve the quality of IS. Therefore, the results of a phenomenographical study have the potential to provide concrete tools with which to understand IS use and use processes.

For further research we propose that using phenomenography is especially useful in experiential computing related research (e.g., Yoo, 2010). For a long time, a fundamental assumption of information technology has been that it is a tool. The value of IT has been understood in the context of enabling mostly economic values in IS literature. Experiential computing adds a new value dimension: some activities and experiences that we enjoy cannot be measured in an economic sense. (Yoo, 2010.) Phenomenography allows seeing technology more through its inherent value, what technology is. This means that some experiences cannot be measured in an economic sense and they still are important to understand.

One more specific example of this may be design science and evaluation of digitalized artifacts in everyday life contexts. In the current design science guidelines artifacts are evaluated based on "functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes" (Hevner et al., 2004 p. 85). Yoo (2010) suggests that for experiential computing also another important criteria, desirability, should be added to the list.

Desirability requires researchers to consider humanistic values as users evaluate digitalized artifacts. Through phenomenographical thinking and users' conceptions there is a possibility to reach a diverse world that is not limited to one criteria or quality attribute.

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