

Phenomenography: a relational approach to research on information needs, seeking and use

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The paper discusses phenomenography with a view to showing how such research may provide different insights into information needs, seeking and use than cognitive or constructivist approaches. Some distinguishing features are pointed out as regards the research focus on phenomena as experienced by users and on variation of experiences. The epistemological stance of phenomenography is emphasized with reference to phenomenology. The concept of experience is examined. Examples from two LIS research projects illustrate empirical research designs, interpretations and outcomes of a relational approach. The conclusions are that a phenomenographic approach may contribute new insights to the objects of research and offer solutions to some of the problems connected with empirical research within the framework of the cognitive viewpoint.

AIM

The purpose of this article is to discuss some characteristics of phenomenographic research and how such an approach may offer solutions to some acknowledged problems and add new dimensions to our understanding of information needs, seeking and use. The discussion will touch upon some theoretical as well as methodological implications of the matter. Examples from two LIS studies adopting a relational approach will illustrate the discussion.

BACKGROUND

Common paths in user studies

It is common to talk about a shift of paradigms in user studies around 1980 with recurring references to Belkin (1), Wilson (2, 3), Dervin & Nilan (4), and others (5). Overviews of user studies i.a. Dervin & Nilan (4), Wilson (6), Julien (7) Westbrook (8) all emphasize the paradigm shift connected to a move from system centered to person-centered user studies and the parallel increase in the use of qualitative research methods. It seems logical

that these developments of research focus and methods go together considering that information needs, seeking and use concern complex human processes that require in-depth understanding of human experiences.

Person-centered qualitative user studies have been strongly influenced by cognitive psychology which led to the formulation of the 'cognitive viewpoint' in LIS, articulated and discussed by Dervin & Nilan (4), Allen (9), and Ingwersen (10) among others. One important characteristic of the cognitive viewpoint is that it focuses on users and their information needs and seeking as related to users' own settings and concerns, not restricted to their interaction with libraries or IR systems. Another typical trait is the constructivist view of information as process and knowledge rather than information-as-thing (11). It is founded on the metaphor of information transfer; that is, a process of communicating information from system to user. The process is assumed to be initiated by the user. According to Ingwersen, information is 'the result of a transformation of a generator's knowledge structures' and 'something which, when perceived, affects and transforms the recipient's state of knowledge' (12, p. 7). This is a constructivist view implying a notion of the world as divided into the outer world of the object (information) and the inner world of the subject (the recipient). The objective of the cognitive approach is 'to improve information transfer, specifically by producing models of users' knowledge that are compatible with the conceptual frameworks used in information systems' (9, p. 4). (In this article I refer to the 'cognitive viewpoint' as focused on cognitive processes, mental models and cognitive structures. I do not primarily refer to research applying users' cognitive styles as an explanatory framework for study (6, p. 30-31)). This objective indicates a third characteristic of the cognitive viewpoint, that is to include information stored in information systems, mediators and users in one conceptual model and to consider these as three main components or actors in information science (12).

Criticism

During the 1990s the cognitive viewpoint has been criticized on certain points:

- a) There is a lack of consistency in the analogy between the cognitive worlds of humans and information systems (13, p. 59). Ellis sees a gap between, on the one hand, artefacts as information systems, texts or

interfaces, and, on the other hand, human processes of thinking and understanding. According to Ellis this is why it is inadequate to study research problems connected to these different areas using the same methods and points of departure implied by the cognitive view of LIS (ibid.) An important aspect of this problem, indicated by several researchers, is the lack of empirical research results using the theoretical constructs of the cognitive viewpoint (13, p 53; 14; 15, p. 216).

- b) A decisive weakness of the cognitive view of LIS, according to Hjørland, is that it is founded on individual mental processes, excluding the social contexts in which human concepts are shaped. It is obvious that the late 1990s have brought an increased interest in context into user studies. However, Hjørland argues that individual knowledge structures as the basis for analysis in information science leads to a dead end for research (16, p. 29; 17, p. 124-133). The study of individual differences coupled to the efforts to find general patterns for human information behaviour applicable in the design of information systems give rise to a dilemma indicated by several researchers (9, p. 18; 17, p. 117-124; 18, p. 156;). Hjørland suggests his theory of domain analysis as a solution to the problem of an overemphasis on individual cognitive structures (17, p. 124-133).
- c) Philosophically based reservations are put forward (e.g., 14; 19). They warn against 'mentalism' in LIS, i.e, focusing research on unobservable cognitive structures rather than manifest behaviour or language. Olaisen claims that traditional approaches in user studies are based on 'the *instrumental man* metaphor emphasizing purposive decision making' and not taking into account random action or vague and undefinable aspects in human behaviour (20, p. 143-145).

A point of epistemological criticism would be that the inherent view of the relation between subject (user) and object (information) of the 'information transfer metaphor' is not consistent with the claims of a paradigm shift in user studies linked to the philosophical foundations for qualitative research.

Phenomenography offers alternatives to some of the indicated problems.

RELATIONAL APPROACH – THE STUDY OF EXPERIENCE

The object of phenomenographic research is the variation of human experience of the world. It is grounded in empirical research on variation in students' learning outcomes and was developed during the 1970s by a

group of researchers led by Ference Marton at the department of Education, at Göteborg University in Sweden (21).

The study of variation implies an interest to capture various facets or dimensions of a phenomenon as it appears to a number of people. The aim is to describe the phenomenon of research interest through a limited number of categories of description which will form the outcome space. This means that the research takes its point of departure in human individuals but the main interest is directed toward the phenomenon under study.

The concept of 'way of experiencing' or 'conception' (I use the terms interchangeably in this paper) is discussed in most phenomenographic studies and has been analysed by a number of researchers (e.g., 22; 23, 24; 25). Ways of experiencing are relations between a person and a specific phenomenon in the world. The research subject, the person experiencing something, and the object, that which is experienced, are not viewed as separated. The way in which the subject experiences the object forms a relation between the two. This is why it has been labelled 'a *relational* approach'.

A core finding from early phenomenographic studies was that differences in students' learning outcomes can be explained through their different ways of experiencing the assignments. Further phenomenographic research has confirmed the idea that people's ways of coping with a problem or acting in a situation are connected with how they experience these problems or situations: 'a capability for *acting* in a certain way reflects a capability of *experiencing* something in a certain way. The latter does not cause the former, but they are logically intertwined. You cannot act other than in relation to the world as you experience it.' (24, p. 111)

The study of human beings' ways of experiencing phenomena in the world is different from the study of the world as it really is. The distinction between the two questions 'What is information seeking?' and 'How do people experience information seeking?' is fundamental to phenomenography. Phenomenographers ask the second type of question and call this a second-order perspective (23). While studies of behaviour adopt a first order perspective focussing on what people do and how they act, the second-order perspective is directed at phenomena as they appear to people. As indicated above, the relational approach implies that people's

ways of acting in a certain situation reflect how they experience the situation.

Difference: conception - mental model

Phenomenographic conceptions are not mental models. What are the differences? How is it possible to distinguish one from the other?

Phenomenographers certainly do not deny that learning or information seeking and use imply mental processes. However, the research is not focussed on these processes but instead on the relation between people and phenomena-in-the-world. This specific focus is related to the difference between 'the first and the second order perspective' indicated above. Studies of mental models is research in the first order perspective, where researchers try to explore existing mental models or structures and use these to explain certain behaviour. Mental models are theoretical concepts about existing structures in the brains of people. This implies a dualistic view of a subjective and an objective world, a separation between the inner world, that is inside somebody's head, and the world out there, e.g. information.

The view of experience as a relation between subject and object, that is, between a person and a phenomenon, dissolves the separation between the two, indicating the non-dualistic stance of phenomenography. Phenomenography recognizes the existence of a real world but this real world is not separated from human individuals. It is constituted of the totality of ways of experiencing this world. There is no other way to know about the world than through human experience. 'Obviously the world cannot be identical with the world experienced by a particular person, but the world experienced by a person and the world in general, are not separate. The former is a part of the latter.' (24, p. 138) As a consequence, phenomenography views learning as a change of the relation between person and world.

What is experience?

Experiencing a phenomenon is a certain way of being aware of something. When analysing the concept of experience phenomenographers have drawn on various phenomenological theories, e.g. Gurwitsch's theory of consciousness (24, p. 82-109), theories of intentionality (ibid; 26).

Experiencing a phenomenon implies that you must be able to discern it

from an environment or a context, it must come forth, as a figure against a ground, e.g., a book on a table, for you to be aware of it. For this to happen you have to experience it as something, a chair or a book, in other words, assign it a meaning. The meaning is the *referential* aspect of the experience, telling you what it is that you discern. The *structural* aspect of an experience is double. It includes both the outer structure of the way of experiencing involved to discern the figure from the ground, e.g., the book from the table, and the internal structure, i.e., the relationship between the different parts of the experienced phenomenon, for instance the print, the pages, the cover and the spine of the book and how these are related to one another to constitute the whole of a book. The outer structure is the 'external horizon' of a way of experiencing the phenomenon and the structure between the various parts of the experienced phenomenon is the 'internal horizon' according to Marton (24, p. 87-89, 100-102). 'A way of experiencing something can thus be described in terms of the structure or organization of awareness at a particular moment' (ibid., p. 100). A graphic presentation of the analysis of what constitutes a way of experiencing something is provided by Marton & Booth (24, p. 88).

Ways of experiencing something, its parts and the relationship between

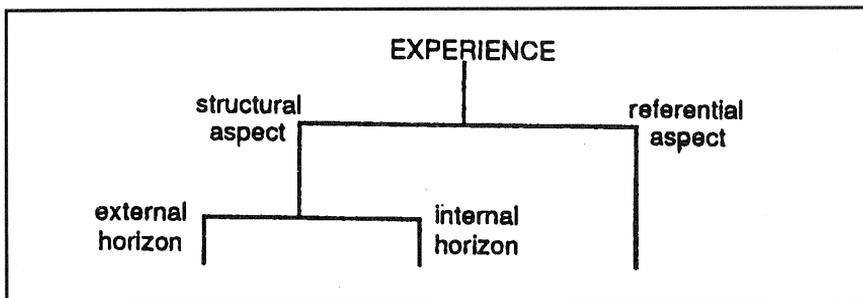


FIG. 1: *The unit of a science of experience. A way of experiencing something (from Marton & Booth, 1997, p. 88)*

these constitute various aspects or dimensions of the phenomenon. In the case of information seeking and use examples of such aspects will be given below.

Phenomenography – phenomenology

As already stated, phenomenography originates in empirical research. The theoretical underpinnings of phenomenography have been gradually developed since the early 1980s to some extent drawing upon

phenomenology (cf. above references). Like phenomenography, phenomenology has human experience as its research object. However, there are important distinctions between the two, some of which are worth indicating here.

Phenomenology is a philosophical school of thought aiming at developing a theory of human experience. As a philosophy it is based on theoretical thinking rather than on empirical study.

The aim of phenomenology is to capture the 'essence' of a phenomenon. This is different from the phenomenographic research interest of investigating and describing phenomena through the variation of people's experience. The outcome space, that is the various categories of description of ways of experiencing and the structural relationship between these categories, constitutes the phenomenon according to the relational approach.

METHODS OF DATA COLLECTION AND ANALYSIS

It is worth observing that there is no manual of phenomenographic method.

Data collection methods

Most phenomenographic studies have used interviewing for data collection. Interviews are aimed at retrieving rich material about the research subjects' ways of experiencing the phenomenon, which is the object of research. There are examples of other data collection methods such as video recordings or documents. The essential requirement for data collection as well as for the analysis of data is that the researcher adheres to the second-order-perspective, focusing on the phenomenon as it appears to research subjects.

As in other qualitative research the selection of interviewees is deliberately non-random. It is guided by the researcher's interest in exploring various ways of experiencing a phenomenon. A particular context or situation may be a criterion for selection. Another criterion may be a research interest in comparing the conceptions of one specific phenomenon between various groups, or, as in my dissertation study, to compare the conceptions of two different phenomena within one group of students. The number of interviewees normally falls between 20 and 50 persons and is related to the scope and possible depth of data analysis.

Interviews are tape-recorded and will be transcribed in extenso for analysis.

Methods of analysis

Collection and analysis of data are closely linked. Analysis of the first data collected may influence the focus of questions in later interviews as well as the selection of further research subjects.

The point of departure for the analysis of interviews is the manifest content of interview protocols. Analysis is guided by the research questions of the study. During analysis the researcher seeks an empathetic understanding of what is involved in the phenomenon of study derived from interviewees' descriptions of what it means to them. The researcher tries to maintain a participant perspective assuming that interviewees' experiences and ways of reasoning are logical, even if they do not appear as such at first. Phenomenographic analysis is an hermeneutical process.

Analysis is conducted through constant comparison between similarities and differences of aspects of content, that is, the meaning aspect and the structural aspects of what is being said by the interviewees. I want to stress that it is not differences between individuals but between their ways of experiencing a phenomenon which are of interest to the researcher. Repeated steps through the analysis includes looking for various aspects of ways of experiencing. The researcher tries to carry out the analysis for one theme or aspect at a time, simultaneously looking for overall patterns formed by the various aspects and how these aspects are related to one another.

Outcome of analysis and presentation of findings

The aim of analysis is to identify and describe people's various conceptions of the phenomenon under study in a limited number of categories. Obviously, it is essential that the categories of description are faithful to the empirical material and logically related to each other. Quotes from interviews will be used for the dual purpose of illustrating a core feature of one category and distinguishing it from other categories. A set of categories of description and the structural relationship between these constitute the outcome space, which can be seen as the collective experience of the phenomenon of study.

Often there will be a hierarchical relationship between the categories, defined through an increasing complexity of ways of experiencing the phenomenon. More complex ways of experiencing means that the categories comprise more dimensions and a simultaneous awareness of

these dimensions. 'The aspects of the phenomenon and the relationships between them that are discerned and simultaneously present in the individual's focal awareness define the individual's way of experiencing the phenomenon' (24, p 101).

EXAMPLES FROM INFORMATION STUDIES

Information seeking in a learning context

For my dissertation research I studied high-school students' various experiences of information seeking and use during a learning assignment in social studies (27). The aim of my study implied a wish to understand the information seeking and learning processes as experienced by the seekers and learners in a naturalistic learning situation. Thus, information seeking and use was studied in a formal learning context. The 25 students of one class were interviewed three times during the process of the assignment. The total empirical material consisted of 75 interviews. Interview questions concerned both information seeking and students' understanding of the assignment topic: 'What will be the positive or negative consequences of a possible Swedish EU membership?' The results and implications of the findings were presented at the ISIC '98 conference and will therefore only be briefly touched upon here (28).

Five series of categories were developed grounded in five aspects of information seeking and use identified through analysis of interview protocols. The final step of analysis was to trace the origins of the categorised statements back to the individual students. The outcome of that revealed an overall pattern that allowed me to identify and describe three major ways of experiencing information seeking and use as:

- A. Fact-finding
- B. Balancing information in order to choose right
- C. Scrutinizing and analysing. (A description of these categories was presented at the ISIC '98 conference, (28))

There is a coherent hierarchical relationship between the three categories which is evident from two points of view;

- a) A-conceptions concurred with a poor learning outcome, B-conceptions coincided with more qualified learning outcomes, and C-conceptions were positively related to highly qualified learning outcomes;
- b) A-conceptions were more limited as regards number of facets or dimensions simultaneously present in students' awareness than B- and

C-conceptions. C-conceptions as scrutinizing and analysing were the most complex considering the number of dimensions and the relationship between them.

Together the three categories of description constitute the outcome space reflecting the phenomenon of information seeking and use as experienced by a group of students.

Information literacy in higher education

In her dissertation research Bruce studied information literacy as experienced by higher educators (22). The research subjects were selected from various universities in Australia and amongst various groups such as lecturers, librarians, counsellors and staff developers. The number of research subjects amounted to 60, participating in the study either as interviewees or through writing.

The findings of this study were presented as 'seven faces of information literacy', that is seven categories of description forming an outcome space. Citing Marton, Bruce says that 'these outcomes form a description of the 'anatomy of awareness' of information literacy amongst the group' (ibid. p. 110).

The seven categories were labelled (label is indicated within brackets in the list below) according to the dominant meaning aspect identified in each conception. Information literacy was experienced as;

- 1) using information technology for information retrieval and communication (information technology conception)
- 2) finding information (information sources conception)
- 3) executing a process (information process conception)
- 4) controlling information (information control)
- 5) building up a personal knowledge base in a new area of interest (knowledge construction conception)
- 6) working with knowledge and personal perspectives adopted in such a way that novel insights are gained (knowledge extension conception)
- 7) using information wisely for the benefit of others (wisdom conception) (ibid.)

The categories are hierarchically related to each other. Analysis revealed that the variation between ways of experiencing information literacy mainly concerned relations between person (subject) and information

(object) (ibid. p. 112). Distinguishing features among the categories are related to the three main aspects of meaning structure, structure of awareness and the varying ways in which information was perceived. The structure of awareness, that is, what is focal in each conception and what is more peripheral, changes between the various categories and creates an interesting pattern, reversing the places between information technology and information use. In category 1, information technology is in the centre of awareness and information use is marginal. In category 2 information sources are the focus of awareness, and information use is still peripheral. In categories 5, 6 and 7 information use has moved from the margins to the focus of awareness with information technology appearing as peripheral in experiencing information literacy (ibid. p. 113-115).

A second important feature of the outcome space resulting from Bruce's analysis is that the ways of experiencing information vary so that categories 1 to 4 conceptualize information as objective and part of the external environment, whereas category 5 views information as subjective and internal to the individual. Categories 6 and 7 experience information as transformational, that is able to be transformed by users for extending knowledge or able to transform users and others (ibid. 115-116).

The picture of information literacy thus created in Bruce's study is richer and more complex than earlier views of information literacy. It includes features from earlier research on information literacy emphasizing the effective use of information technology, locating information sources or skillful execution of information search processes. However, it is not limited to such views, it extends our knowledge about information literacy as evident through the conceptions of information literacy as knowledge construction, knowledge extension and wisdom, which have not been present in earlier writing on information literacy.

Similarities between studies

Besides the obvious affinity between the studies of Bruce and Limberg connected to the research design there are similarities in the content or meaning of the findings which are worth observing. Both studies emphasize information use as an essential aspect of the phenomena of study. A gradually subordinate role of information technology connected to the more sophisticated ways of experiencing information literacy or information seeking is also evident. The dimension of critical analysis is central to the knowledge base conception of information literacy as well as

to the conception of information seeking as analysing and scrutinizing. The varying ways in which information appears in Bruce's study have a likeness with the distinguishing feature between 'finding the right answer', 'choosing the right side' or 'creating an answer of your own' belonging to the A-, B-, and C-conceptions of information seeking in Limberg's study. The studies are also complementary, one focussing on educators' conceptions and the other one on experiences of students.

POTENTIAL OF PHENOMENOGRAPHY IN LIS

New insights through phenomenography

The new insights into the objects of research have some traits in common and can be traced to the particular research approach;

- a) the emphasis on *use* aspects appearing in the more sophisticated categories of information literacy as well as in the B- and C-conceptions of information seeking and use are new or rare in scholarly writing about these phenomena;
- b) the discovery in Limberg's study of the importance of information content as experienced by users engaged in information seeking and use;
- c) the discovery in Bruce's study of the various ways of experiencing 'information' as objective, subjective or transformational;
- d) the emphasis on social aspects of information use apparent in both studies. Bruce underlines the importance in her findings that most ways of experiencing information literacy 'suggest that information literacy is a social responsibility' as opposed to much other writing describing information literacy as the responsibility of individuals (22, p 161). The strong coherence between ways of experiencing information seeking and use and group patterns were emphasized also in my findings (27; 28, p 125)

As I see it, the combination of serious endeavours to reach an empathetic understanding of research subjects' experiences and the focus on capturing and describing variation allow such new insights. An effort to create one general model would have prevented the appearance of those dimensions in phenomena which are not common to all or the majority of a group of research participants.

Contributions from information use research to phenomenography

Most phenomenographic studies have explored experiences of phenomena

at a particular moment in time, such as that of information literacy by Bruce. My study focussed on a process, that is a phenomenon over a period of time, which is unusual in phenomenography. Earlier research has studied learning processes as changing ways of understanding a phenomenon and presented categories related to before and after a course unit. In my categories changing ways of experiencing relevance, information overload and bias are included in the B- and C- conceptions. This is the first time that phenomenographic categories of description have been presented with dynamic features, and as such a contribution from LIS research to phenomenography. As I see it, this is due to the well established understanding of information seeking and use as a dynamic process. This has been stressed by several researchers, e.g., Kuhlthau, Saracevic and Wilson (30). My research project exemplifies a new way of using the relational approach for studying a process.

Bruce's study contributed to new theoretical insights into phenomenography as regards the nature of the outcome space, where three elements were involved, as well as the dual description included in each category of meaning and structure of awareness. Usually categories of description concentrate on one or the other (22, p. 180-181).

Generalising variation

As pointed out earlier, it is the different relations amongst a group of individuals and a specific phenomenon that are being studied and presented in a *limited* number of categories of description. The implication is that the categories describe not people but experiences of the phenomenon of interest. Categories describe variation on a *collective level*. This is a way to solve the dilemma between individual differences and the wish to find general patterns. The patterns will concern phenomena, not people. The findings from Bruce and Limberg of the social dimensions experienced by users in information seeking and use also pertain to the balance between individual and collective aspects and should be considered in future research on information seeking and use.

When conceptions are separated from the individuals who originally held them, they may be compared with findings from other studies in other contexts. An example might be to study the interaction between information seeking and use and learning in the context of professional development in a workplace and compare those findings with my findings from the context of education.

Evidence of generalisation from my results was found through a comparison with Bruce's findings of ways of experiencing information literacy. Other similarities were found between my three categories and Perry's scheme of students' intellectual and ethical development during the college years (28, p. 127-128). The outcome of these comparisons are examples of how phenomenographic research results may be generalised.

Credibility

An essential aspect of the credibility of phenomenographic research is that the categories of description actually refer to the phenomenon which is the object of research. Doubts have been expressed that if interviews are made about a phenomenon independent of any context, there is a danger that researcher and interviewees are actually not talking about the same thing (25, p. 24-26; 31, p. 61). When, as in my study, interviews were conducted with students when they were actually engaged in the process under study, there is less room for misunderstanding or twisted interpretation.

Credibility is also based on the researcher's open presentation of steps and decisions taken during analysis. The connections between the empirical material and the categories of description must come through. This is well exemplified in Bruce's dissertation (22, p. 95-106). Other important issues for the credibility is that research findings are communicated in an intelligible form. Descriptions of variation must be recognizable and acceptable, they must make sense to other researchers.

Empirical strength

With its origins in empirical research, phenomenography continues to prove fruitful for empirical research in various fields including information needs and use studies. However, it need not be restricted to the field defined as user studies within LIS. Any phenomenon may be investigated through the experiences of any group of persons. The majority of phenomenographic studies have been related to varying ways of understanding concepts like photosynthesis, matter or force. In LIS, the study of concepts such as relevance, information need or information overload might follow this tradition. The varying ways of experiencing information in different contexts may be investigated, for instance in formal education, for life-long learning, or in a societal context. It also has a potential for studies of artefacts like texts, information retrieval systems or interfaces. (Recently Bruce had an article published advocating the relational approach in LIS research and providing some other examples (29)).

Epistemology and research focus

A recurring theme of this paper has been the difference between the dualistic view of a cognitive or a constructivist approach and the non-dualistic stance of phenomenography. Since a way of experiencing is a relation between person and world, i.e. between subject and object, it is part of both. With this view a learning person does not 'receive' information. The terms 'receiver' or 'recipient' are frequently used in LIS. The terminology reveals epistemological and ontological differences between the various approaches.

The implications of these differences are far-reaching for the study of information needs, seeking and use. The cognitive/constructivist view focuses on information transfer, studies cause and effect, aims at general models and adopts a first order perspective. The phenomenographic approach studies human beings' experience, focuses on discovering and understanding relations between subject and object and uses a second order perspective. An essential difference is that phenomenographers focus on the content of people's experiences, not on cognitive structures. These differences and their implications are discussed in much phenomenographic writing (e.g., 22, p. 78; 24; 27, p. 77-84, 230-232). The non-dualistic stance of the relational view is consistent with hermeneutical or phenomenological understandings underlying much qualitative research.

CONCLUSIONS

The claim of this paper is not that phenomenography is superior to all other research approaches but that it provides useful alternatives where other methods have fallen short. The discussion of theory and examples of research emphasized some distinctive features of the relational approach. The focus on variation instead of the general allows new dimensions of phenomena to appear. The focus on experience instead of persons allows researchers to direct attention toward any phenomenon of interest, not toward mental models or cognitive structures. The relational approach offers new paths for empirical research on information seeking and use that may solve some acknowledged problems in user studies linked to the cognitive viewpoint. The research findings discussed in this paper indicate that new and different insights are being reached through a relational approach. The theoretical strength is linked to the epistemological stance of the relational approach and provides a good foundation for qualitative research.

The contributions mentioned from information needs and use studies to phenomenography point to a potential for LIS to further develop such research and may arouse an interest for more studies adopting a relational approach within our discipline.

REFERENCES

1. BELKIN, N. J. (1980). Anomalous states of knowledge as a basis for information retrieval. *Canadian Journal of Information Science*, 5, 133-143.
2. WILSON, T.D. (1981). On user studies and information needs. *Journal of documentation* 37 (1), 3-15.
3. WILSON, T. D. (1990). Object or participant: the information user in information research. *Swedish Library Research / Svensk biblioteksforskning*(3), 5-16.
4. DERVIN, B., & NILAN, M. (1986). Information needs and uses. In *Annual Review of Information Science and Technology*, 23, 3-33.
5. FIDEL, R. (1993). Qualitative Methods in information retrieval research. *Library and Information Science Research*, 15, 219-247.
6. WILSON, T. D. (1994). Information needs and uses: fifty Years of progress? In B. C. Vickery (Eds.), *Fifty Years of Information Progress: A Journal of Documentation Review* (pp. 15-51). London: Aslib.
7. JULIEN, H. (1996). A content analysis of the recent information needs and uses literature. *Library and Information Science Research* 18, 53-65.
8. WESTBROOK, L. (1997). User needs. In A. Kent (Eds.), *Encyclopedia of Library and Information Science*. (pp 316-347) New York: Marcel Dekker, Inc.
9. ALLEN, B.L. (1991). Cognitive research in information science: implications for design. *Annual Review of Information Science and Technology*, 26, 3-37.
10. INGWERSEN, P. (1995). Information and information science. In A. Kent (Eds.), *Encyclopedia of Library and Information Science*, (p. 137-174). New York: Marcel Dekker.
11. BUCKLAND, Michael (1991). *Information and information systems*. New York: Greenwood Press.
12. INGWERSEN, P. (1996). Cognitive perspectives of information retrieval interaction: elements of a cognitive IR theory. *Journal of Documentation*, 52, (1), 3-50.
13. ELLIS, D. (1992). The physical and cognitive paradigms in information retrieval research. *Journal of Documentation*, 48, 45-64.
14. ENMARK, R. (1997). Punkten som inte finns - om ett ämnesdefinierande informationsbegrepp. *Human IT*, (2), 6-30.
15. VAKKARI, P. (1996). Library and information science: content and scope. In E. Munch-Petersen, P. Wilson, Johan Olaisen (Eds.), *Information Science. From the Development of the Discipline to Social Interaction*. (pp 169-231). Oslo: Scandinavian University Press.
16. HJØRLAND, B. (1991). Det kognitive paradigme i biblioteks- og informationsvidenskaben. *Biblioteksarbejde* (33), 5-37.
17. HJØRLAND, B. (1997). *Information seeking and subject representation. An activity-theoretical approach to information science*. Westport, Conn. & London: Greenwood Press.
18. HEWINS, E. T. (1990). Information need and use studies. *Annual Review of Information Science and Technology*, 25, 145-172.
19. BLAIR, D. (1990). *Language and representation in information retrieval*. Amsterdam: Elsevier.
20. OLAISEN, J. L. (1985). Alternative paradigms in library science. The case for paradigmatic tolerance and pluralism. *Libri*, 35 (2), 129-150.

21. MARTON, F. (1994). Phenomenography. In *The International Encyclopedia of Education*. Second edition, Vol. 8. (pp 4424-4429). Torsten Husén & T. Neville Postlethwaite (Eds.). Pergamon.
22. BRUCE, C. (1997). *The seven faces of information literacy*. Adelaide: Auslib Press.
23. MARTON, F. (1981). Phenomenography - describing conceptions of the world around us. *Instructional Science*, 10, 177-200.
24. MARTON, F., & BOOTH, Shirley (1997). *Learning and awareness*. Mahwah, N J: Lawrence Erlbaum Associates.
25. SÄLJÖ, R. (1996). Minding action - conceiving of the world versus participating in cultural practices. In G. Dall'Alba, & Hasselgren, B. (Eds.), *Reflections on phenomenography. toward a methodology?* (pp. 19-33). Göteborg: Acta Universitatis Gothoburgensis.
26. SANDBERG, J. (1994). *Human competence at work*. PhD thesis, University of Göteborg, Sweden.
27. LIMBERG, L. (1998). *Att söka information för att lära. En studie av samspel mellan informationssökning och lärande*. [Transl. Experiencing information seeking and learning. A study of the interaction between two phenomena] Göteborg and Borås: Valfrid. Ph.D Thesis. Göteborg University, Sweden.
28. LIMBERG, L. (1999). Three conceptions of information seeking. In T. D. Wilson & D. K. Allen (Eds.), *Exploring the contexts of information behaviour: Proceedings of the Second International Conference on Research in Information Needs, Seeking and Use in Different Contexts, 13-15 August 1998*. (pp. 116-135). London: Taylor Graham.
29. BRUCE, C (1999). Phenomenography: opening a new territory for library and information science research. *The New Review of Information and Library Research 1999*, 31-47.
30. WILSON, T. D. (1999). Models in information behaviour research. *Journal of Documentation*, 55, 249-270.
31. BOWDEN, J. A. (1996). Phenomenographic research - Some methodological issues. In G. Dall'Alba, & Hasselgren, B. (Eds.), *Reflections on phenomenography. Toward a Methodology?* (pp. 49-66). Göteborg: Acta Universitatis Gothoburgensis.