

(Presented at Lifelong Learning Conference, Yeppoon, June 2002)

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**UNDERSTANDING AND INFLUENCING A LEARNING COMMUNITY:
RESEARCHERS' WAYS OF SEEING THE SIGNIFICANCE AND VALUE OF
RESEARCH PROJECTS**

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ABSTRACT

We are seeking to understand the 'learning community' of QUT's information technology researchers by examining critical differences in their ways of seeing the significance and value of diverse research projects. The aims are to provide insights into barriers in the formation of intra-disciplinary partnerships and to assist with strategic development.

INTRODUCTION

In the field of information technology (IT) research, rapid development in both theory and application in recent years has led to a fragmentation of the domain and a consequent focus of researchers on different parts of the research territory. At the same time, the convergence of communication technologies and the need for integrated systems required by complex applications have created an impetus for collaborative efforts from different IT research areas. Furthermore, research is increasingly perceived as an aid to wealth creation; and consequently, strategic linkages between different sectors, as well as within and across the IT disciplines, are expected to enable substantial research projects with wider impact to be achieved, and to facilitate technology transfer of knowledge to commercial sectors. However, experience suggests that such collaboration is difficult to realize, and involves considerable effort from all partners.

What problems arise from different ways of seeing research that hinder collaboration both within and across disciplines, and between academic and industry partners? How could collective learning about different ways of seeing research lead to collective understanding, and in turn stimulate and facilitate research partnerships? In order to respond to these questions, we have sought to better understand the 'learning community' of QUT's information technology (IT) researchers by examining critical differences in their ways of seeing the significance and value of diverse research projects. In a previous paper (Bruce and Pham, 2001), we have reported an investigation on ways of seeing IT research in a broader framework. This paper deals with a more specific aspect of the collective consciousness of IT researchers.

THEORETICAL FRAMEWORK

Understanding the collective consciousness of a learning community is an important facet of building that community. Bowden and Marton's (1998) framework of the university as a learning community involves both learning at the individual level, that is learning in the context of studying, and learning at the collective level, or research (p 80). Within this framework, learning is considered to occur when there is a change in awareness; when individuals or groups come to see some aspect of the world differently, thus widening the individual or community perspective.

Research communities are necessarily learning communities and understanding the character of these learning communities is critical to helping to build them. Marton and Bowden (1998) suggest that the partnerships and collaborations that are essential

to healthy learning communities are only possible when participants share or understand each others' ways of seeing their research objects and territories.

It is these ways of seeing, that, when taken together, comprise the collective consciousness of a research community. IT researchers' different ways of seeing the significance and value of research projects are the subject of the investigation reported here. The research outcomes represent the collective consciousness of the participating researchers in relation to this facet of the character of IT research.

METHODOLOGY

In order to understand researchers' different ways of interpreting the significance and value of IT research, we adopted a phenomenographic approach. Phenomenography (Marton and Booth, 1997, Bowden and Walsh, 2000) has been used since the 1970s for eliciting significant differences in ways of seeing or conceiving different phenomena in many disciplines. The approach has also been recently successfully used to examine researchers' conceptions of research (Brew, 1998), students' conceptions of research (Kiley and others, 2000), and the collective consciousness of materials scientists (Baillie, C, Emanuellson, J. and Marton, F, 2001).

Data for this project was gathered using semi-structured interviews. Open questions were designed to allow respondents to describe how they interpreted the significance and value of research projects. A series of abstracts from journal articles or conference papers, representing different facets of IT research, were used as a basis for communication in the latter part of the interview protocol.

The interview protocol included the following questions:

- A. Can you tell me briefly about your current research and explain its significance and value?
- B. What kinds of research projects do you see as being considered significant, valuable within your research group? Why?
- C. In your view, are the projects described in these abstracts significant? Explain.
- D. How do you in general, decide whether specific projects are significant and valuable?

Altogether twelve researchers, representing different parts of the IT research territory, different genders, and with different levels of research experience, participated in the data gathering process.

Following transcription of the interviews, the research team engaged in an iterative analysis of the data. This analysis was underpinned by an understanding of *conceptions*, or *ways of seeing*, as interpretable through an exploration of the different awareness structures that mediate people's experience of the world; and of *phenomena* as interpretable through a representation of the possible relationships between those awareness structures (Marton, 2000). Our analysis process identified five different conceptions (or ways of seeing) of the significance and value of IT research (the *phenomenon* being investigated). The next section of this paper presents these five ways of seeing, together with evidence from the data.

HOW IS SIGNIFICANCE AND VALUE CONSTITUTED IN THE RESEARCH COMMUNITY?

This investigation has revealed that, even amongst members of what might be considered to be the same research community, significance and value are not constituted in the same way. For IT researchers, the same projects might appear to be significant or valuable for widely varying reasons. Concomitantly, the same project might appear significant to some, but not to others who interpret significance differently.

The five different ways of seeing significance and value are depicted in five categories of description. Each of these five categories represents one lens through which a researcher might view a project. Each category is associated with particular meanings, foci of attention, and perceptual boundaries. The relationships between the different categories are captured in the widening of their perceptual boundaries from 'the individual' to 'the institution of research' and to 'humankind'. Figure 1 displays a graphical representation of these categories and their relationships.

Category 1: The Personal Goals Conception

In this category, the chief interests of IT researchers, when attributing significance or value to a project, are personal. Significant and valuable research projects are seen as those which help them attain their personal goals. They may be attending to the interest level of the project for themselves (Subcategory 1a) or for their own research areas (Subcategory 1b).

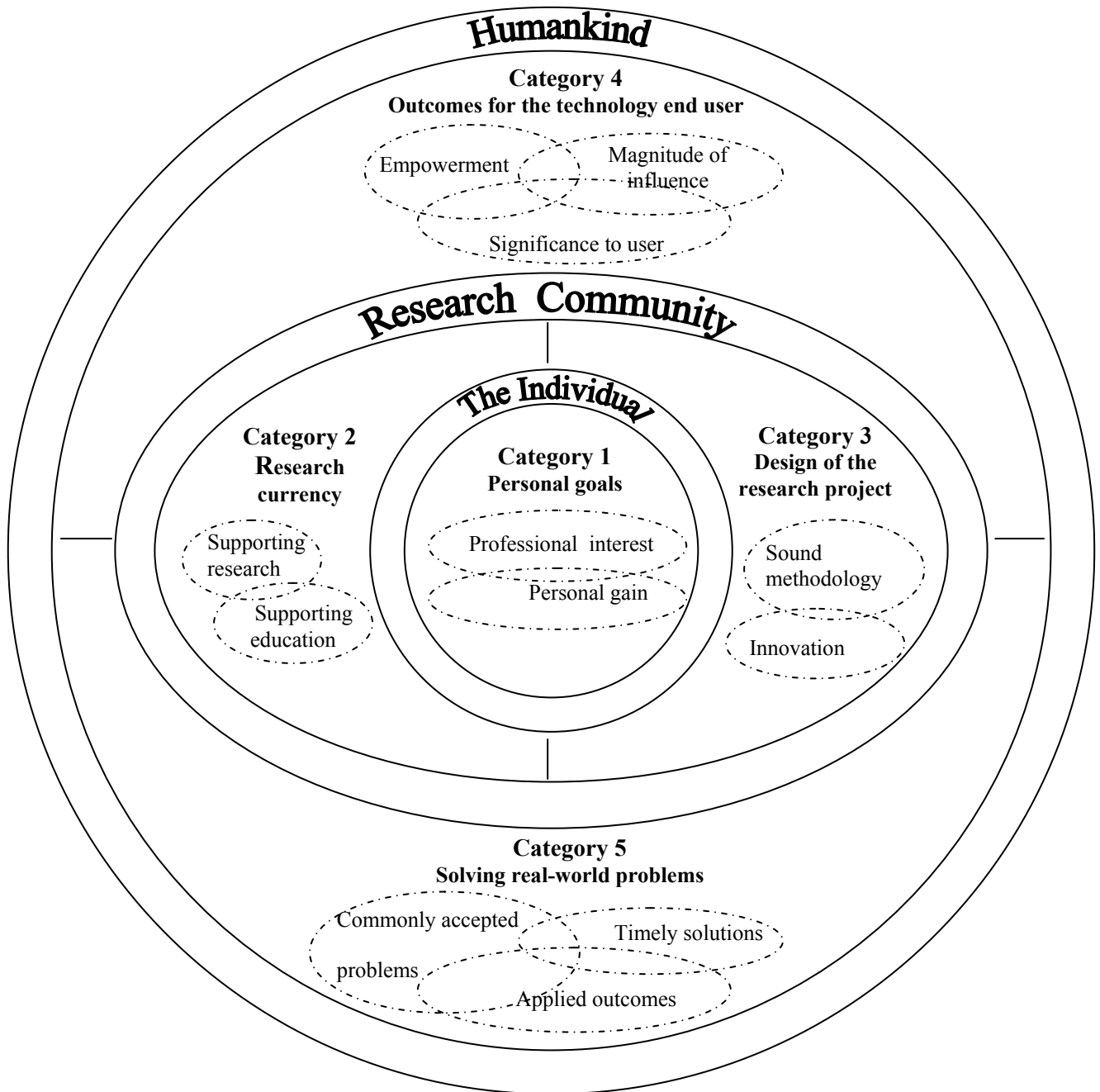


Fig. 1. Graphical representation of researchers' outcome space.

In *Subcategory 1a*, significant and valuable research projects are seen as those which interest the researcher. They may ‘*like to do it*’ (11.2b), the project may arouse their curiosity (9.2b), or the researcher may find the research fun to be engaged in.

In *Subcategory 1b*, significant and valuable projects are seen as those which contribute positively to the researcher’s own career and research agenda. These research projects advance the researcher’s career in some way, by providing employment or the opportunity for publication.

... *you would probably judge something as insignificant if it doesn’t contribute ... if it doesn’t advance in some way your career* (11.3b)

The focal element, or *internal horizon*, common to both subcategories, is the ‘personal goals’ of the researcher, with varying orientations towards ‘professional interest’ or ‘personal gain’ in terms of career or research output, associated with each subcategory. In this category, it appears that IT researchers are not seeing beyond their own benefits when considering the value of a research project. The individual, therefore, forms their perceptual boundary, or, in phenomenological terms, the *external horizon* of the category.

Category 2: The Research Currency Conception

In this category, significant and valuable research projects are seen as those which generate research currencies. They add value to the research community by providing funding for the employment of researchers or enabling a research centre to continue to exist. They may be producing publications, providing grant money, enhancing group status, promoting colleagues or leading to further work.

... it enables us to get some useful publications in the same field ... (7.2b)

I think that most people would expect a significant project ... would lead to further work, or would lead to further publications and particularly acceptance ... at conferences which were considered to be ... fairly top-level type conferences ... and would be leverage ... for further funds and further work. (7.3a)

... at the moment it gives us money to employ researchers or to continue employing researchers whom we have been employing ... (7.2a)

One of the recipients was very honest ... he had a project, 2 million marks or something ... and he stood up and said, "Well, I think it was very successful, this project - as a result we have three professors, they got their chairs because of it" and I think that was straight to the point, it told the truth ... (11.4c)

The focus of attention, or internal horizon in this category, is the currencies of research. The research community forms the perceptual boundary or external horizon of the category.

Category 3: The Design of the Research Project Conception

In this category, significant and valuable IT research projects are seen as those which are academically sound. When using this lens, the chief concerns of IT researchers have to do with the quality of the research itself. They are interested in the nature of the project and its validity as research, with particular emphasis on the design of projects (Subcategory 3a) and their potential for contribution (Subcategory 3b).

In **Subcategory 3a**, significant and valuable IT research projects are seen as those which are designed and carried out appropriately. These projects are seen as those

which follow recognized research methodology. They are conducted by respected researchers with the aim to contribute significantly to new knowledge. They require considerable intellectual input. They have clear direction, with a solution in sight. They are able to be validated or believed. They draw on a breadth of participant base or are widely applicable. They acknowledge previous research. They may break away from funding or commercial imperatives. They follow research trends, interests or traditions.

It has to be methodologically sound, you have to apply your scientific method ... there is a whole lot of theory about ... how you proceed in finding ... new knowledge ... (11.5a)

... what actually makes it important is the design of the research program to be fairly all-encompassing ... trying to maintain a consistent theme across all the projects while allowing academic and research freedom ... (6.2b)

In **Subcategory 3b**, significant and valuable IT research projects are seen as those which explore new frontiers and add to previous research. The element of innovation present in the research may be in breaking new theoretical ground, in taking a new approach to a long-standing problem or in a contribution made to the existing knowledge base. An element of risk of failure accompanies such endeavours. Difficult questions/problems may be confronted or speculative endeavours engaged in.

... you have to make a contribution to the knowledge base, so I think you have to give some new knowledge in some sense ... (8.4c)

... it's a novel way at looking at an important problem ... (3.3a)

... if they're actually coming up with some theory ... (5.7a)

In this category, ‘the design of the research project’, is the focus, or internal horizon, with the varying orientations in either ‘sound methodology’ or ‘innovation’. As in Category 2, IT researchers are not seeing beyond research itself when considering the value of research projects. The research community, therefore, forms their perceptual boundary, or the external horizon of the category.

Category 4: The Outcomes for the Technology End User Conception

In this category, significance or value is attributed to a project, in terms of service to people. When looking through this lens, researchers see significant and valuable research projects as those which serve information technology end-user. They may be attending to the potential for the project to help people experience the advantages of technology (Subcategory 4a), to impact positively on the whole of society (Subcategory 4b), or particular subgroups of society (Subcategory 4c).

The focus, or internal horizon, of IT researchers in all these subcategories is on benefits to the end-user. They are interested in the positive results of the project for people. In this category, IT researchers are seeing the end user in the context of the benefit the research offers to humanity. Humankind therefore forms the perceptual boundary, or external horizon, of the category.

In ***Subcategory 4a***, significant and valuable IT research projects are seen as those which enable people to live or work better together. These projects make it possible for people to use technology more easily or to manage information more skillfully, thus improving on current practice. In this view, significant and valuable research should enable technology to adapt itself to people, reducing the need for people to adapt to technology. Such projects improve life for humankind.

You want to push the technology so that it serves people in the most intuitive and flexible way. (1.2a)

In **Subcategory 4b**, significant and valuable IT research projects are seen as those which impact widely on the population at large. Significant research projects are seen as those that have a breadth of applicability so that they serve the largest possible body of users. Such projects may also span disciplines and adopt an integrative approach. The length of time over which projects extend their influence may also be relevant.

... the idea of size comes into it ... the narrower the community the less interest you would have in it ... (3.4c)

... world-changing ... world impact ... very few projects can actually achieve that but if it can often make steps towards that, that's important. (6.5c)

In **Subcategory 4c**, significant and valuable IT research projects are seen as those which serve specific groups of people. They meet the needs of particular sub-groups of society. Examples of these subgroups are analysts, professionals and educators.

... its significance is that it helps analysts ... (4.2c)

... a lot of research which doesn't have obvious application has the application of informing education better ... to me the fundamental reason for academies is education ... (10.6d)

Category 5: The Solving Real-World Problems Conception

In this category, significant and valuable IT research projects are seen by researchers as those which address real-world problems. Their interests, when using this conception, are directed towards finding solutions to problems; with different

emphases on well established problems (Subcategory 5a), contemporary problems (Subcategory 5b) and those which have practical application (Subcategory 5c).

In **Subcategory 5a**, significant and valuable IT research projects are seen as those which address real-world problems that have been identified by a number of people. The problems dealt with are known, accepted, identified and long-standing.

... the reason why ... projects within the research area are significant is because all the projects ... address identified and immediate problems. (6.3a)

In **Subcategory 5b**, significant and valuable IT research projects are seen as those which find timely solutions. These projects are up-to-date. They are completed before the problem addressed becomes a non-issue. The problems they concentrate on are of immediate interest. They follow trends with respect to academic interest and with respect to end-users' needs and anticipated demands.

... it needs to be timely. There needs to be ... a bit of foresight, a bit of ... prediction as to where the demands or where the industry is going to be in a few years' time ... you've ... got to solve problems that you believe are going to be problems by the time they're solved. (6.5a)

... its significance is that ... it can be applied ... immediately ... (5.5c)

In **Subcategory 5c**, significant and valuable IT research projects are seen as those which result in an application in a real-world context. Even the significance of 'pure' is seen in terms of its future use for problem solving. According to this view, solutions found in research must eventually be implemented in order for that research to be significant.

... it has to have a real world application ... everything has to be for something ... (8.3d)

... information technology is an engineering discipline ... we are in the business of creating applications, of using the knowledge to produce useful gadgets, artefacts, programs, whatever ... (11.6b)

When considering the value of a research project, using this lens, researchers are focussing on ‘solving real-world problems’. Each of the subcategories is associated with varying orientations towards ‘commonly accepted problems’, ‘timely solutions’ and ‘applied outcomes’. They are also looking towards the influence of that research on humanity. Humankind, therefore, forms the perceptual boundary, or external horizon for this category.

DISCUSSION

This project has begun to illuminate what are presently hidden agendas and largely unarticulated views about what constitutes valuable and significant IT research. Such an illumination is not intended to produce agreement. Rather, it will develop a process of critical reflection and produce a preliminary framework within which researchers can understand their differences and seek avenues for research convergence and cooperation.

Understanding this aspect of IT researchers’ collective consciousness provides insights into some possible motivations and barriers in the formation of strategic intra-disciplinary partnerships. While we are yet to engage in the use of this newly

formed framework with the research community, some early comments are possible.

The results of this investigation show that the significance and value of specific research projects may be interpreted very differently by researchers in the same collegial environment. If we assume that commitment, or willingness to pursue a research project is predicated, at least in part, on a valuing of that project, then the results suggest that such valuing may or may not be interpreted in the same way between research partners. Concomitantly, the adoption of different perceptual boundaries or different foci between potential intra-disciplinary collaborators, in relation to the question of significance, may hinder prospective collaborations. It is possible that intra-disciplinary research partnerships and collaboration may be challenging where participants do not appreciate each other's ways of seeing, or do not share the same views.

It appears, therefore, that building or strengthening learning communities for researchers could involve raising awareness of these different ways of seeing amongst neophytes, including research students, as well as more experienced researchers.

Learning or developmental strategies based on this research, would attend to revealing the different possible points of focus, and widening perceptual boundaries for both of these groups, as well as encouraging reflection and discussions between different members of the community. Such awareness raising opportunities would have the potential to strengthen the collective consciousness, and should encourage reflection on the possible variation and implications of that variation. If research partnerships are more likely amongst colleagues who have similar ways of seeing, then self understanding and appreciation of the viewpoints of other groups members might

assist the identification of natural research partners, as well as alerting potential partners to complementary ways of thinking.

FUTURE DIRECTIONS

This investigation represents an early step in coming to understand the learning community of IT researchers. We have developed a framework depicting one facet of the collective consciousness of IT research, a picture of the different ways in which significance and value is interpreted by IT researchers. This framework will enable self-reflection and awareness within the IT community, and may be used for comparison with the understandings of other stakeholder groups such as industry and interdisciplinary partners. The next phase of the project reported here attends to the views of industry partners, in appreciation of the major changes in contemporary construction of the research agenda (Jacob and Hellstrom, 2000). Further work will investigate IT researchers' views of the research territory in order to understand other, and wider dimensions of the collective consciousness of IT research.

We can conclude from the project thus far, that investigating the collective consciousness of learning communities may provide useful insights into the character of those communities; and that such investigations might aid our understanding of research communities, as well as coursework communities, in the university environment.

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Acknowledgements: The research reported in this paper is supported by a QUT Scholarship in the Professions Grant, 2001, and the Australian Computer Society.