AN ALIGNMENT MODEL FOR THE RESEARCH HIGHER DEGREE SUPERVISION PROCESS USING REPERTORY GRIDS

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ABSTRACT

Conducting higher degree research in the Built Environment is an ill-defined process. It is expected that higher degree candidates can emotionally detach themselves and develop independent competence throughout the research process. For this to occur supervision is a key factor not just for degree completion but also for expected research skills development. The aim of this paper is to review both the research process and factors influencing supervision with regard to both student and supervisor perceptions. Having discussed issues relating to the research process and supervision the paper proposes a model to be used to facilitate improved understanding of the student – supervisor relationship. The model is based on the ‘repertory grid’ technique which, using bi-polar constructs, allows both the student and supervisor to rate their perceptions at different points in time during the life-cycle of the research project. Given the theoretical nature of the paper no specific conclusions, based upon empirical studies, are presented, other than a suggestion that more research, both theoretical and empirical, should be conducted in this important area.

Keywords: research higher degree candidate, repertory grid, skills development.

INTRODUCTION

The student – supervisor relationship is a key factor in achieving timely and successful higher degree (i.e. masters and doctorates) research outcomes. In regard to this there are pressures upon Australian universities in relation to higher degree students as the funding of such students is significantly related to the ‘completion’ of their studies. A survey by Harman (2002) of Australian research-intensive universities showed, “…low student satisfaction levels due to poor quality supervision…” Harman (2002) also identified the issue of expansion in PhD enrolments in Australia since the early 1990’s, suggesting that universities had not kept pace with the needs of a growing body of research students, leading to increasing levels of student dissatisfaction. A survey of United Kingdom PhD students, reported in Haksever and Manisali (2000), found that 30% of the cases cited relating to non-completion of studies were due to problems with supervision. Harman’s (2002) research concurred with this finding.

Therefore previous research studies have identified the issue of research supervision as being a critical factor in achieving positive outcomes for higher degree research. The objective of this paper is to discuss issues which relate to the research process and
to the student – supervisor relationship. A principal conclusion of Haksever and Manisali’s (2000) research was that the development of a framework to, “…promote dialogue…” between students and supervisors would contribute to improved outcomes. Such a framework, in terms of the proposal of an alignment model, is discussed and presented in this paper.

THE RESEARCH PROCESS

An awareness and understanding of both student and supervisor of the research process that lies ahead is critical to the success of any research higher degree studies. In addition, having a strategy to ensure successful completion is also essential. This section of the paper aims to outline issues relating to the key ‘components’ of the research process.

There are many books that purport to give guidance on research processes and methods, both in general terms (i.e. Howard and Sharp, 1983; Phillips and Pugh, 1987; Jankowicz, 1995) and, more recently, construction-related texts (i.e. Runeson and Skitmore, 1999; Fellows and Liu, 1997). It is important to put research in a ‘context’ in order to discuss it in more detail. Therefore the context proffered for this paper is taken from a process developed at the University of Newcastle for undergraduate students undertaking the final year of study in a Bachelor of Construction Management (Building) program, with honours (University of Newcastle, 2004). In this program students undertake to complete a piece of empirical research over two full semesters of full-time study. The program structure differs from many other University undergraduate models, where the dissertation is one course studied concurrently with a number of other courses. At Newcastle students are only enrolled in one course at a time, and in their final year concentrate solely on the research dissertation. This makes the research process closer to the postgraduate model than most undergraduate models in existence elsewhere.

Whilst acknowledging that the process to be described has been developed to examine undergraduate students the authors of this paper believe that this is a valid construct to present key factors and phases in the research process that are also clearly applicable to higher degrees by research. Given that the undergraduate period of study is only one year the ‘scope’ and ‘complexity’ of the research will be less than that expected for research higher degrees of two to three years (full-time equivalent) duration. For example, the Higher Education Research and Development Society of Australia [HERDSA] (Moses, 1985) lists 31 requirements of an Australian PhD thesis. Perry (1998) states that there are different levels of expectation in Moses’s paper, with five of the 31 requirements not being required for Masters and undergraduate honours research projects. However, the presentation of the Newcastle undergraduate process does allow for discussion of issues that are applicable to higher degree studies.

The University of Newcastle (2004) course material outlines a research process with three components:
• Theory
• Test, and
• Conclude

These components of research can be regarded as sequential, starting with theory development and ending with conclusions. This could be considered as a ‘traditional’ model of research, aligning with Hughes’s (1994) views of a PhD process of, “…consisting of three trimesters, the first to define and contextualize the problem, the second to do the field work and the third to write the thesis.” Perhaps the three components of research presented above could be more appropriately represented as three points on a ‘circle of research’ where, given different research approaches and/or methodological positions, the starting point of the research process may not always be the ‘theory’ component (Marshall and Rossman, 1989). One example of an alternative would be the ‘grounded theory’ approach where, as Strauss and Corbin (1990) state, “One does not begin with the theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge.” Therefore new theory may emerge from a ‘test and conclude’ exercise. It is important to acknowledge that there is not a single, universal approach to the research process; nor should there be.

Theory

There is an old Confucian Chinese proverb which says that, “A journey of a thousand miles begins with a single step.” The theory stage of the research process, as a starting point, involves the selection of a topic and a research area. With some initial ideas in mind the first research ‘step’ should be a comprehensive literature search and review. In the past this step could prove to be difficult in terms of access to information being readily available. The growth in information technology (i.e. online journals, web-based articles and reports) has led to a proliferation in information available to researchers, requiring well-developed skills in information searching; particularly during this first step of the research to ensure that recent and relevant literature is discovered (Neuman, 1997).

Jankowicz (1995) proposes that researchers should ask themselves a number of questions when choosing a topic:

• Does it interest you?
• How much do you know about it already?
• How difficult is it likely to be?

Hughes (1994) suggests that the first task for a student, in consultation with their supervisor, is to agree a detailed specification for the research, and goes on to cite Kane (1985) who contends that, “The most difficult hurdle to overcome in doing research is not in learning the techniques or doing the actual work or even writing the report. The biggest obstacle, surprisingly, lies in figuring out what you want to know.”

Numerous authors have put forward suggestions as to how to focus research at this first ‘step’ of the process. Jankowicz (1995) suggests, “…working up and narrowing
down…” a topic by moving from an “area” (i.e. construction management), to a “field” (i.e. legal issues) to an “aspect” (i.e. dispute resolution). Kane (1985) states that a “research statement” should be produced, Howard and Sharp (1983) propose a “topic analysis”, Leedy (1985) tenders the need for a “problem statement” and Black (1993) contends the need for clear “research questions and hypotheses”.

At the University of Newcastle (2004) the outcome of the theory stage of the undergraduate research course is the submission of a detailed research proposal which includes the following sections:

Introduction: explaining the background to the research; definition of research area / boundaries; subject area context [400 words maximum].
Research Aim, Objective(s), Hypotheses: stating the general research aim, measurable objective(s) and hypotheses [if appropriate], and explaining their importance to the defined research context [400 words maximum].
Research Method: explaining and justifying the proposed research methodology (i.e. nature of data required, collection method(s) and forms of analysis) [400 words maximum].
Restraints / Limitations: explaining likely restraints and limitation (i.e. resources available, access to data, data analysis, ethical considerations) [300 words maximum].
Research Programme: a bar chart indicating principal activities and milestone dates.
Draft Literature Review: detailing a review of literature related to the research topic, describing and discussing existing theories, citing leading sources of literature [using the ‘Harvard’ referencing system], and identifying key issues emerging from the literature reviewed [no word limit].
References: a list of references cited in the literature review [no word limit].

This exercise sets the ‘foundation’ for the research and facilitates discussion and further development of the research, including planning for the next stage, between student and supervisor. The above exercise is not dissimilar to the requirements of Universities for their research higher degree students to produce progress reports (at least annually), which may also be used to upgrade students from masters to doctoral level research (i.e. University of Newcastle, 2000).

Test

Having clearly defined a research scope and developed a research direction the next ‘step’ is to define a test which contributes to satisfying the research aim, objectives and hypotheses. Given the wide range of types of research projects conducted in the field of construction management numerous different research methodologies, ranging from the natural to social sciences, may be utilised. If the research involves the collection of empirical data then issues of validity, reliability and objectivity need to be addressed (Black, 1993). Perry (1998) draws a distinction between “explanatory” research, which is quantitative (i.e. considering what the precise relationship between variables is), and “exploratory” research, which is of a qualitative nature (i.e. looking at what variables are involved), and can be considered, according to Mostyn (1985), to be, “…to determine what, where, when, and how many, rather than why.”
At the University of Newcastle (2004) the outcome of the test stage of the undergraduate research course is the submission of a draft research methodology and an application for ethics approval, if the research involves collecting data from non-publicly available sources. Ethics approval is required for surveys, questionnaires and any data collection methods impacting upon humans at undergraduate (University of Newcastle, 2003a) and postgraduate levels (University of Newcastle, 2003b).

Once again, when considering this step in the research process at higher degree level, it can be seen as another ‘check-point’ allowing further discussion between student and supervisor, and providing an indicator of the student’s progress so far.

Conclude

The final, and critical, ‘step’ in the research process is to reach an outcome in the form of conclusions. This involves comparing “theory” with “test” (if taking the ‘traditional’ research approach) to determine if the research aim and objectives have been achieved, and, if the research has hypotheses, if they are proven, or not. Black (1993) provides a list of “…common sources of misleading conclusions…”, which includes: ignoring data which is contrary to the research hypothesis; conclusions extended to a larger population than the one investigated, and conclusions beyond the stated research boundaries (i.e. aim and objectives). This is also the final ‘writing-up’ stage where it is critical that the student clearly communicates what they have done in the research. Hughes (1994) states that, for many students, the most daunting task is writing-up their work. A logical structure and presentation of the research is essential, “telling the story” to the reader, using typographically and grammatically correct conventions (see good and bad examples in: Truss, 2003). The Australian model of examination, based upon reading and assessment of the thesis by two or three examiners, with no oral examination (common in other parts of the world such as Europe), places greater importance upon how a student writes up their research. The defence of the thesis which takes place in an oral examination needs to, where no oral occurs, be made, clearly, in words, and other visual media, on paper.

**SUPERVISION AS A NON-LINEAR PROCESS**

Traditionally, both, literature and university printed guidance on the research process provides prescriptive guidance (University of Newcastle, 2000). However, there are a limited number of sources that acknowledge the tangled process of thesis development in higher degrees. The more typical literature, including universities’ own guides, prove to be rigid and highly prescriptive about supervisor, supervisee and the thesis or object of study (Lawson, 2000). For example, Phillips and Pugh (1987) suggest steps and sequential timetables. However, in reality, the situation often proves to be a different one. The process of doing research is hardly one that goes from a to b to c. According to Grant (2003) the process is iterative, complex and unstable and for the same reasons it would be sensible to consider developing less prescriptive approaches towards supervision.

Figure 1 illustrates the complexity and non-linearity in the supervision process. The model was firstly proposed by Grant (2003) and provides a potentially powerful tool to explicitly externalise the situation. Figure 1 also shows direct and indirect links in
the supervisor-student-thesis relationship. The relationship between supervisor and student adjoins a third element of “knowledge” which in the figure relates to the thesis. The relationship between these three elements is in constant change (Grant, 2003). Such an arrangement is affected through power relationships that work through actions; these actions have an effect upon the elements and highlight more subtle difficulties dealing with personality, cultural and power differences. This is illustrated by showing direct and indirect links between the three agencies: the student, the supervisor and the thesis. Power relations can be a consequence of aspects of institutional position and can also vary across disciplines, institutions and nations (Hofstede, 1986).

Figure 1. Student-supervisor multilayer relationship (Based on Grant, 2003).

Although bright as undergraduates, novice higher degree researchers need to develop their skills further when doing higher degree research. They can often be insecure, inexperienced, and demand close supervision. They may see the thesis as a culturally prescribed artefact and it will take some time before a student can comprehend the implications of doing postgraduate research (Johnson, 2000). Gurr (2001) suggests that the role of supervising would typically involve feedback, time, money, networks, and recognition to the student by an established authority in academia. Hughes (1997) disagrees with this and argues that the supervisor does not necessarily need to be an expert in all areas/fields and that the researcher should also seek support from within the department, the university and the wider research community.

Table 1 was originally developed by Cullen et al (1993) to pinpoint the supervision styles across individuals and academic disciplines. For instance, supervisors from computing, economics, physics and engineering disciplines tend to provide a closer style than those from arts, history or sociology. This relates to Hughes’s (1994) discussion on styles in supervision in built environment research. He argues that
building and built environment research should seek the support of core disciplines such as economics, law, cybernetics, psychology amongst others. If building related research is to grow and be beneficial to industry and the wider scientific community, it must establish itself as a “field of application”. If this is the case, it would exacerbate the complexities to apply standard codes of practice because areas of research supervision could span across many fields.

Table 1. Supervisory styles (Cullen et al, 1993)

<table>
<thead>
<tr>
<th>Style:</th>
<th>Close</th>
<th>Hands off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meetings:</td>
<td>Regular, frequent</td>
<td>Irregular</td>
</tr>
<tr>
<td>Project:</td>
<td>Collaborative</td>
<td>Individual</td>
</tr>
<tr>
<td>Relation to supervisor’s research:</td>
<td>Closely related</td>
<td>Unrelated</td>
</tr>
<tr>
<td>Joint Publication:</td>
<td>The norm</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Mentorship:</td>
<td>The norm</td>
<td>Rare</td>
</tr>
</tbody>
</table>

Figure 2 typifies the supervision process in terms of skills and expectations. Supervisees typically demand supervisory expertise in most of these areas (e.g. theory, methodology, writing skills, etc.). In reality it is very unlikely that a single supervisor possesses all of these skills. This often applies in social science related research where students are expected to develop critical thinking and defend their research ontologies and epistemologies (Heath, 2002).
In the traditional sense, the supervisor-student apprenticeship has been described as “…the most important channel of intellectual inheritance between one generation and the next”, and good supervision is central to thesis completion (Lawson, 2000). On the other hand it is expected that research students develop their own ideas and test their own hypothesis, and not that of their supervisors. A graduate from a higher degree by research (especially in PhDs) is expected to be academically competent and independent. Achieving this is, perhaps, the toughest test in the supervision process.

DISCUSSION OF A PROPOSED MODEL FOR STUDENT-SUPERVISOR ALIGNMENT

This section introduces a model which, whilst being simple, provides value for academic supervision across the wide range of disciplines. The model seeks to raise awareness of the norms, expectations and standards within their discipline and be able to assess their own plans and actions to ensure compliance with them (Gurr, 2001). The aim is ultimately about teaching the student to be their own supervisor (Phillips and Pugh, 1987).

Gurr’s (2001) model operates to promote a ‘plan-act-review’ learning cycle. In the increasingly common arrangement where associate supervisors or supervisory panels are involved, additional parties can be invited to join subsequent discussions. Figure 3 illustrates the dynamic alignment model (Gurr, 2001),
Possible Conflict

Autonomy Generation

Appropriate Support

Being Neglect

where:

- Direct active style: Characterised by initiating, criticising, telling and directing
- Indirect active: Characterised by asking for opinions and suggestions, accepting and expanding supervisee’s ideas, or asking for explanations and justifications of supervisee’s statements.
- Indirect passive: Characterised by listening and waiting for supervisees to process ideas and problem solving.
- Passive: Characterised by having no input and not responding to supervisee’s input.

The model is aimed at assisting researchers in producing a successful thesis. A flexible approach is required on the part of the supervisor, an approach that must be informed by open discussion with the student. Therefore, there is a need to find and use a technique for this. This paper proposes the ‘Repertory Grid’ method (Denicolo and Pope, 2001). The repertory grid technique is based on the principles of ‘personal construct psychology’ (Kelly, 1955). The use of an alignment model in conjunction with repertory grids provides a means of judging the degree of, and framework for working towards, effective supervision.
APPLING THE MODEL USING REPERTORY GRIDS

A comprehensive explanation of the personal construct theory and technique is beyond the scope of this paper. However, the authors are experienced in the use and implementation of the technique (e.g. Aranda and Finch, 2003). A repertory grid technique is proposed to facilitate the implementation of Gurr’s (2001) dynamic alignment model. Denicolo and Pope (2001) identify the value of repertory grids to explicitly indicate thinking in the supervision process and to track and record perceptual and emotive changes. Grids can be used to facilitate conversation and provide focus in the supervisory relationship.

Construct systems are traditionally developed through triad elicitation (e.g. Denicolo and Pope, 2001). This means that a respondent or interviewee is asked to find similarities and differences of three elements at a point in time. Those similarities and differences become what are known as a bipolar construct system. A series of bipolar constructs outline ‘attributes’ to a concept. In the context of this paper such a concept would be ‘supervision’.

Grading a repertory grid system follows a similar procedure to that of the Likert scale (Allport, 1935) or Osgood’s (1954) semantic differential. Ratings are assigned to a bipolar construct system; this would facilitate a relational structure between elements and construct polarity. The repertory grid shown in figure 4 illustrates a focused construct system and it’s relationship to what is perceived as effective supervision by both, supervisor and student.

Figure 4. Initial rating (i.e. topic definition)

At this initial stage, the student perceives appropriate support and the supervisor also considers that the supervisee needs it. However, according to Gurr (2001), close support should take place only at an initial stage otherwise there is a high chance for conflict to occur as the student gains more research control and direction (see figure 3). At this initial stage the student is more receptive and the supervisor is rather
paternalistic. The grid technique is for continuous use by both the supervisor and the student and is to provide a means for discussion over differences and expectations so as to monitor changes over time. The grid provides insight into what student and supervisor mean by ‘effective supervision’.

The repertory grid shown in figure 5 reveals how the student now perceives an appropriate supervisory style. Certainly they are experiencing a more demanding stage with less direct guidance; the distance between the two has increased. At this stage the student has started building confidence and is more in tune with the situation.

Figure 5. Progress rating (i.e. theory development)

The grid shown in figure 6 illustrates how the supervisor has moved towards a ‘hands-off’ style which they perceive to be the effective one at this stage. The student has some anxieties but, with the assistance of the grids, they can both discuss the current situation. The supervisor may make it clear that it is time for the student to take ‘authorship’ of their work from this point onwards, which is expected in higher degrees. The student feels somehow neglected; however, it has been important to be made aware of the expectations of the supervisor.

Figure 6. Further progress rating (i.e. data analysis)
A breakthrough arises at this stage, as the student realises that they need to embrace or take control and direction of their project. The supervisor is still there but the relationship is somehow unstructured and there is no formal account of progress. The student frequently falls into procrastination and shifts attention to other activities such as tutoring.

Figure 7 illustrates the situation towards thesis completion where the relationship seems to have improved. The student has overcome anxiety and insecurity and keeps better progress records by taking full control over the project. Although more confident, the student is always experiencing anxiety but this might remain until after the examination process is completed.

Figure 7. Rating towards completion

The grids presented in this section have been used to illustrate personal perceptions of the supervisory process by both student and supervisor.

CONCLUSIONS

Heath (2002) found that the differences between student and supervisor can be improved by the frequency of meetings. This paper argues that the ‘quality’ of such meetings is the most important factor. Utilising techniques to explicitly show the perceptions and expectations of both parties can provide the right scenario for iterative discourse.

It is concluded that, to improve both thesis completion rates and the quality of research, a model for student-supervisor satisfaction is essential. This paper proposes a technique to facilitate such a process. The repertory grid technique can provide insight into the student-supervisor relationship by explicitly revealing views and perceptions. It can also provide stronger objectivity in the progressive assessment.
process. Finally it is hypothesised that the level of anxiety in the supervisory process would be reduced.

A major Australian report on PhD supervision, conducted at the Australian National University [ANU], (Cullen et al, 1993), concluded that, “…the identification of effective supervisory practice was best accomplished not through simple aggregation of existing best practice, but rather through the deconstruction of supervisory practice and through the identification of those aspects of supervisory practice which would most benefit from strengthening, elaboration and change.” The report also identified three main issues requiring attention:

“Supervision should be conceptualised to encompass a broad view of PhD education which includes more than one-to-one interaction of a student and a supervisor; Programs for staff and students to improve practice can and should be designed to contextualise the generic process of supervision with attention to disciplinary and usual human variation, and,
There is a need to go beyond individual supervisory interactions and restructure practice to ensure that responsibility for quality is shared and co-ordinated.”

This paper has put forward three main themes for consideration. The first describes the research process, which provides a “context” for consideration. Second, aspects in relation to research supervision are discussed. Then a model to assist in the understanding and facilitation of student – supervisor interaction is proffered. Given that the research process and the interactions and relationships between student and supervisor are complex, no definitive conclusions are drawn. However, a suggestion for further research in this area is that the model presented be further reviewed and refined to enable some empirical studies to be conducted.

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