# Learning skills and capacities at RHD level

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*Abstract:*  *Only very recently has research focused on what postgraduate students really learn. The Australian Postgraduate Research Experience Questionnaire, based on theory of student learning at undergraduate level, does ask students about their development of particular generic skills. Furthermore, some scholarly work (as well as a good deal of institutional development) has recently given attention to the development of generic skills at the postgraduate level.*

*This paper reports on an investigation across all departments in one university of postgraduate student perceptions of their learning. The discussion will focus on: a) the wide range of skills and capacities reported to have been a part of student development; b) their importance; and c) how they were learned.  A significant finding in relation to how students learned was that students valued independence as learners but at the same time valued learning from others, whether supervisors, other staff, students, or academics from other universities.  Student responses evince independence not as isolated learning but as control and management of one's own learning, facilitated by a thriving intellectual and social climate.*

## Introduction and literature review

Learning outcomes and skills development are presumed to be central to postgraduate study. Yet research into outcomes of postgraduate education has emphasised short-term and non-learning outcomes such as completion and time-to-completion (e.g. Sheridan & Pyke, 1994; Martin, Maclachlan & Karmel, 1999; Wright & Cochrane, 2000; de Valero, 2001; Marsh *et al*, 2002).  While much work has been done on learning outcomes, including "a plethora of . . . research studies on what are generally called "transferable skills", they are almost entirely at undergraduate level" (Cryer, 1998, p. 207).

The very scarce research or development focused directly on student learning at the postgraduate level has been work intended to:

- define desirable skills;
- help students develop such skills;
- probe the perspectives of employers as well as graduates on the development and application of skills; and
- explore skills learned or perceived to be learned by research higher degree students or graduates.

Attempts to define the skills appropriate to postgraduate research education, even tangentially, have included scholarly work by Barnacle, 2002; Candy, Crebert & O'Leary, 1994; Cryer, 1998; George, 2002; Katz, 1997; Tansley & Wilks, 2001; Witte & James, 1998. Institutional efforts to define graduate attributes or desirable skill development have been notable in the last few years. While the Council of Australian Deans and Directors of Graduate Studies identified important skills for RHD students, including skills associated with research and the thesis as well as  personal and career development, Australian universities were expected to adopt distinctive strategies to help students develop desirable graduate attributes (Manathunga, 2002).

*Transferability* of skills was Cryer's primary concern. She developed a program in the United Kingdom to address the problem that "there is little, if any provision to help the students to recognise, identify and build in the "transferable" aspects of the skills which they are developing as a natural consequence of undertaking a research degree, or to make a sound case for the existence of these skills in job interviews" (p. 216). Skills may be defined through employer expectations and the performance of postgraduate students after employment (Cushlow & Morris, 2000).

A very limited amount of research has focused on postgraduate student learning. In relation to skill development, Pearson (1996) in Australia called attention to capabilities that had been acquired by doctoral students "with varying degrees of effectiveness" (p. 306). These tended to be technical or managerial in nature, including self-management, sometimes explicitly involving a community of researchers. The Postgraduate Research Experience Questionnaire yields data on student perceptions of skill development (Ainley, 2001).

There is an obvious need for study of learning by postgraduate students. The purpose of the present paper is to discuss empirical research on what current postgraduate students perceive to be the skills and capacities that are a) important and b) learned through their study – as well as c) *how* they learn those skills and capacities.

**The study and initial analysis**

Using Surveymaker.com, a web-based survey of Griffith University research higher degree students was conducted in 2002. Of 1,119 students, 414 or 37% responded from 43 out of 45 schools. Five open-ended questions were preceded by a large number of questions eliciting demographic data and information on supervision, infrastructure support, skill development, social and intellectual climate, goals and expectations, modes and frequency of supervision, and satisfaction with various kinds of assistance from the University (library, computing, learning assistance, student services, etc.).

The source for the data reported here is an internal university report in 2003 "Survey of Research Higher Degree Students" (hereafter "Survey"). Responses to three open-ended questions about student learning (the skills and capacities considered important, skills and capacities learned, and ways students had developed these skills and capacities) are the primary concern of this section of the paper. (The quotations immediately below are all from "Survey", pages 18-19.)

The responses suggested that students generally considered the skills and capacities that they had learned to be similar to those that were important. Sorting responses by frequency yielded five major skill categories.

The majority of students considered that they had learned *analytical skills or critical thinking*. The category was a broad one including "the ability to critically evaluate problems or scenarios and to decide on an appropriate course of action".

*Communication skills* were either written or oral, with writing commented on most often. Written ability was seen as "important in conferences as well as the confirmation and examination stages of the RHD process". Oral presentation skills were mentioned by a smaller group of students.

Commented on by a large group of students was the *ability to work independently*. This included the "ability to work without supervision for extended periods of time and to source the necessary information required to choose appropriate courses of action".

Following these in number of times mentioned were *project/research management skills* (including time-management skills – "the ability to manage pre-specified deadlines and to work accordingly"), *problem-solving skills*, and *research skills* (including statistics, research methods, and design)*.*

When students were asked *how* they felt they had learned skills and capacities needed for their research, most important was "self-discovery which included making mistakes, experiential learning, and learning via reading". However, to "a lesser extent" they learned "from others around them including colleagues, supervisors, other academics, and friends" in both formal and informal settings.

The importance of students' being self-taught is consistent with the high value placed on autonomy, freedom and independence in responses to another question. When students were asked what were the "*best aspects* of your experience as a research higher degree student", the issue most frequently commented on (after the study itself/the opportunity to gain knowledge or learning in the field of expertise) was the value of autonomy or freedom. "Many respondents indicated that the ability to operate independently was the most enjoyable aspect of being a research higher degree student."

**A possible inconsistency – and further analysis**

This love of autonomy associated with self-discovery through the students' own efforts seems on the surface to contradict important findings concerning the dissatisfaction students feel because of their isolation. Of all of the scales on the Postgraduate Research Experience Questionnaire, the lowest mean (expressing the highest dissatisfaction) is for "intellectual and social climate" – and this is true for Griffith current postgraduate students as well as graduates nationally (Survey, 2003, p. 14). For decades researchers have highlighted the problems of isolation. At the University of Melbourne, isolation was shown to be the most significant university-related issue related to withdrawal and failure to complete the research higher degree (Powles, 1989). These findings would appear to suggest that students wish to work as part of a *community* rather than as autonomous individuals.

How can we reconcile these two positions - valuing independent learning but deploring isolation?  Of course, independence and isolation are by no means synonymous. However, the question of the relationship of autonomy and community is crucial.

To address this question required an additional holistic analysis of all five of the open-ended questions, focusing specifically on responses of students who attested to, or showed appreciation of, learning independently or autonomously. The intention was to explore the relationship between, on the one hand, *independence, autonomy and self-discovery* and, on the other hand, *community,* as dimensions of the way individuals learn. Responses fell into four categories:

1.    A few students value independence and autonomy much more strongly than (or almost to the exclusion of) community. For example, one arts student declares that the "best" aspect of the RHD experience was "the opportunity to exercise some academic independence". In this case "I did not undertake any form of formalised learning . . . . The constant application of effort resulted in me learning the best learning methods appropriate to my research objectives". [It is important to have a]  "tolerance for long term social isolation" and "strong senses of discipline, organisation and routine".  A science student who considered the best aspect of the experience to be "finding/formulating new ideas/discoveries" thought an important skill was the "ability to work independently". Learning took place through "experimentation and literature".

There was no reference in either of these students' comments to supervisors, other staff or students, or any interactive activity, suggesting these students saw themselves as working largely alone – and happily.

2.  A few students value autonomy partly by default – that is, their independence is related to insufficient support. They are compelled to work alone or to seek help that is relatively inaccessible. One student's strategy for learning was "By feeling isolated and becoming more motivated to find the help I needed". Another who said the "best" aspect of the RHD experience was "proving to myself that I can work independently – without help", responded to the question of how s/he learned with: "The PhD is a lonely experience, applicants don't even know the right questions to ask, let alone what their rights are". This student seems to value working independently because there is no other option. While another student values finding "solutions and answers to my own problems and needs" and learns by means of "greater independence, more devotion to self learning and sel[f] reliance", s/he nevertheless suggests that the research experience would be improved by "more interactive discussions with students of same interests".

3.  A larger number of students show a positive attitude toward both a sense of autonomy and a sense of community. For example, an education student considered the "best" aspect of the RHD experience was "Actually achieving my own goals" – but this statement was followed immediately by another "best" aspect: "quality supervision". When asked how skills were learned, this student suggested "Individually… with some postgrad forum, supervisor input and undergrad honours experiences".  Hence this student sees as fully compatible pursuing an individual agenda alongside supervision, postgraduate forums.

    For one science student, the "best" aspect of the experience was the "Exciting project – I am able to explore my own ideas" and (almost without taking a breath, so to speak) the student continues "- fantastic academic staff who are never too busy to lend a hand".  Another considered "best" *both* the "independent nature of the degree" *and* "world class supervision". For this student, the lone activity of "writing many draft versions" is closely linked to the interactive process of "submitting [those drafts] to supervisor". This person also points to "experience as a research assistant" as a help "in my own data collection".

4.  Finally, a significant number of students who suggest they are independent and autonomous learners also indicate that they are "in control of" their learning and are calling on a wide range of resources to assist them as they manage their own learning. For example, one education student suggested what was best was "managing my time and my supervisors". Here the student's language explicitly suggests that supervisors are a resource to be managed. This student made the comment that "[I] know where to find information for my study; [am] able to select relevant information; critically appraise" readings; "my supervisors say I have improved in communication and written skills". Furthermore, the student is ultimately engaging in self-assessment, after considering input from the supervisors, by "beginning to appreciate my work, which according to my interpretation is a sign of good progress".

    The best aspect for one psychology student was having "ownership over my own project…".  This person thought it important to work "independently and to develop the ability to manage research projects", indicating that learning occurred by "working independently", undertaking "a large project from conception to completion", presenting "research work formally via publication and conference presentations." At

the same time, the student learned "By having a supervisor who respects my autonomy and encourages publication submissions and conference papers". Learning also occurs through sessional teaching which "greatly enhanced my research and statistics ability" and through "meeting up with colleagues in another university and seeing how they approach the area". The language of this response suggests control over learning activities. The supervisor's "respecting my autonomy" is the first-mentioned supervisory quality.

Respondents in the two largest categories, 3 and 4, suggested that either they saw no incompatibility between their love of independence and their dependence on the community – or they explicitly saw themselves as independent learners drawing on the resources of the community in managing their own learning.

**Discussion: What have we learned about postgraduate students as learners?**

The skills most important for students, and learned during their research higher degree study, were, in order of the frequency with which they were mentioned:

- analytical skills/critical thinking;
- communications skills, especially writing;
- ability to work independently;
- project/research management skills, including time-management;
- problem-solving skills (more than to analyse – to resolve); and
- research skills related to the ability to design and execute a program of research.

It is worth noting that "management skills" are part of this list. The six categories of skills have parallels with, though they do not range as far as, lists of skills that have been considered important for postgraduate students to learn as articulated by a variety of institutions and in scholarly discussion elsewhere.

When asked *how* these skills were learned, students suggested (again in order of the frequency) that they learned through:

- self-discovery (including trial and error, experience and reflection on what was experienced or observed, and reading);
- colleagues (e.g. other research students, other academics, through informal discussion and formal settings including conferences);
- supervisors;
- other academics (particularly those in the same school); and
- friends, especially other research students who shared experiences and listened and gave feedback on one another's ideas.

When further analysis of relationships between responses to other open-ended questions is considered, the prominence of self-discovery as a way of learning is seen to relate to various resources for learning in an interesting way.

It appears that postgraduate students who both value self-discovery and consider it primary to their learning have an image of themselves as *managers of their own learning*. For management of their learning as autonomous learners to be successful, it is clear that they need resources to manage. Other human resources (after themselves) were most often mentioned in response to a question about how they learned – supervisors, other academics, research students, and friends. Mention of social settings, whether informal or formal, was common. The apparent incompatibility between the high learning value placed

on independence, autonomy and freedom – and on community – is in fact explicable. Students see themselves as learners in control of, or managing, their own learning. In isolation, they have little to manage outside themselves.

These results have close links with Pearson's findings (1996). While two of Pearson's skills categories have to do with technical competence (such as computing) or techniques for analysis, three of her skill categories explicitly mention "management":

- management of the logistics of research which involved getting together the resources which can include equipment, technicians, documents and so on;
- self-management particularly for juggling responsibilities and time, learning how to make decisions about what to do and when to stop;
- management of others whether technicians, supervisors, or other academics;

The two other categories specifically refer to the research community:

- strategies for accessing a peer network of other student/researchers;
- experience in mixing with other academics, giving papers and becoming part of a culture as a colleague. (Pearson, 1996, p. 306)

The prominence of management and the community in her findings can be seen as supporting the argument based on our own research: that students tend to be independent learners, learning through self-discovery and acting as *managers of their own learning*, calling on the resources of the research community (as available) to achieve success.

**Closing**

Students in our study tended to love freedom and autonomy. They mentioned frequently that they are learning independent learning skills. This emphasis on   independence may superficially raise questions about what has been learned in the literature about students' desire for a thriving intellectual and social climate and frequent opportunity for contact with others.

However, it is clear from the data that students value highly both independent learning and a thriving research community. The most compelling way of interpreting what students are saying is that they are autonomous managers of their own learning, seeking what they need to learn from their own reading, their own experience, observations of the experience of others – and engagement with others within their research community to assist in their development. As we consider ways to respond to the data, we may want to concentrate on a) respecting the autonomy of students as managers of their own learning and b) ensuring that a diverse and lively research community is available to provide the resources to "manage learning" well.

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