Generic attributes as espoused theory: the importance of context

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Abstract   There has been considerable interest in generic attributes in higher education for over a decade and yet while generic skills or attributes are an important aspect of policy, there is often a lack of consistency between beliefs about the importance of these skills and attributes and the degree to which exist in teaching practice. There has been an assumption that these attributes exist outside of the disciplinary context, yet the findings of this study suggest that they are strongly influenced by the disciplinary culture in which they are taught. The study reported in this paper examines the apparent gap between ideal notions of generic attributes and their enactment in teaching practice. This qualitative study examined the teaching of generic attributes in five disciplines (physics, history, economics, medicine and law) in two Australian universities. It found that the notion of generic attributes is highly complex and while attributes such as critical thinking, problem solving and communication are valued by teaching staff they are often implicit in teaching. This gap between what is valued and what is actually taught is a result of variation in interpretation of generic attributes, the difficulties of reducing complex attributes to definable learning outcomes and practical constraints on teaching caused by factors such as large classes. Furthermore, it can be explained by the finding that generic attributes are part of the epistemic culture of the disciplines and often remain tacit. The findings of this study have significant implications for scholarship, policy and pedagogy.

Keywords   Disciplinary culture · Espoused theory · Generic attributes · Generic skills · Teaching

Introduction

There has been considerable interest in generic skills and attributes in higher education for over a decade (Assiter 1995; Australian Council for Educational Research 2001; Barnett

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1994; Barrie 2006; Bennett et al. 2000; Dearing Commission 1997; Drummond et al. 1998; Fallows and Steven 2000; Marginson 1994; Sumsion and Goodfellow 2004; The Secretary's Commission on Achieving Necessary Skills 2000). However, while generic attributes are an important aspect of policy, they often exist as espoused theory (Argyris and Schon 1974) rather than as clearly articulated teaching practice. This paper argues that the relationship between ideal notions of generic attributes and the ways in which they exist in teaching practice is not always consistent. To date much research into generic attributes has assumed that they are universal, yet the findings of this study suggest that they are strongly influenced by the disciplinary culture in which they are taught. The study reported in this paper examines the apparent gap between ideal notions of generic attributes and their enactment in teaching practice. It finds that the notion of generic attributes is highly complex and while skills or attributes such as critical thinking, problem solving and communication are valued by teaching staff they are often implicit in teaching. This incongruence results from a number of factors: generic attributes are considered separate from disciplinary knowledge or not part of the role of the academic; a lack of clarity surrounding generic attributes; practical constraints; and the intrinsic complexity of generic attributes.

The notion of generic attributes as integrated with content knowledge is not new. It is arguable that universities have always been concerned to foster generic attributes, particularly higher order skills. However, what has changed is that now universities are making generic attributes explicit (Bowden et al. 2000). More than 10 years ago Clanchy and Ballard (1995) argued that generic skills can only be developed within the specific contexts of disciplinary knowledge and that the disciplinary knowledge within which generic skills are learned determine the form which these skills will assume. Earlier, Stephenson (1992) objected to the separation of generic skills from specialist knowledge, describing this as 'bolt-on capability'. Bowden and Masters (1993) use the term 'generic capacity' in reference to the integration of disciplinary and professional knowledge. Bowden et al. (2000), reporting on the project of the Australian Technology Network Universities, argued for the use of the term generic capabilities in reference to their integration with disciplinary and professional knowledge. The Australian Technology Network Universities project identifies graduate attributes or capabilities in a number of disciplines at a range of higher education institutions and outlines practical steps towards the implementation of such programs. There has been a considerable amount of research which has suggested that the teaching of generic attributes is not a straightforward proposition and further, that universities have not uniformly achieved their aim of enhancing the teaching of generic attributes (Barrie 2007; Bennett et al. 2000; Crebert 2002; De La Harpe et al. 2000; Drummond et al. 1998; Sumsion and Goodfellow 2004). Barrie (2004) points out that 'despite extensive funding in some quarters, overall efforts to foster the development of generic attributes appear to have met with limited success'. This paper examines some of the reasons underlying this apparent limited success.

Barrie (2006) has identified four distinct understandings of generic skills/attributes in higher education: the precursory, complementary, translation and enabling conceptions. The first understanding sees them as attributes to which disciplinary knowledge can be added, the second as a complement to the discipline specific understandings but not part of the discipline, the third views generic attributes as enabling the translation of university learning into other settings and the fourth is the most complex understanding, viewing them as the aptitudes that lie at the heart of scholarly knowledge and can both support the creation of new knowledge and transform the individual. Barrie's study along with a number of others (Bennett et al. 2000; Bowden and Marton 1998; Clanchy and Ballard

1995) point to the clear lack of consensus regarding the nature of generic skills and attributes, and their place in the curriculum. The use of the term generic attributes in much of the more recent literature is an acknowledgement of the problematic nature of the term skill (Holmes 2000).

Kane et al. (2002) argue that there is a tendency in the higher education research to make claims about teaching practice based solely upon teachers' beliefs. While the present study is not based upon observations of teaching practice, it aims to partially address the concern voiced by Kane et al. by considering the inconsistencies between teachers' aspirations regarding generic attributes, their self-reported teaching practices and the documentation of their teaching practice, as found in subject outlines, teaching and assessment tasks.

An important issue in an examination of teacher perceptions are the notions of espoused theory and theory-in-use. These terms arise from Argyris and Schon (1974) and later Argyris et al. (1985). Theories of action are the 'repertoire of concepts, schemas and strategies' (Argyris et al. 1985) which form a plan of action and are comprised of the beliefs and values and assumptions which are designed to bring about a desired outcome. According to Argyris and Schon, theories of action exist at two levels. The notion of espoused theory encompasses the world view and values upon which people *believe* their behaviour to be based. When asked about their behaviour in a certain situation, people will respond with their espoused theory. This is the formal, idealised account of the reasoning underpinning their action and encompasses their aims and intentions. However, theory-in-use is the theory that underpins action and determines behaviour. Theory-in-use is the set of values suggested by action or the maps people use to take action and there can be incongruence between espoused theory and theory-in-use. Theories in use are predominantly tacit knowledge and so cannot easily be articulated (Bereiter and Scardamalia 1992; Polanyi 1966).

In short, Argyris and Schon (1974) postulate that people hold maps in their heads about how to plan, implement and review their action but are not always aware that the maps used to take action are not formulated upon their explicitly espoused theories. There are a number of reasons for this incongruence, including lack of awareness of the gap, pragmatic decisions and self-defence. The notion of espoused theory is significant in this study since while participants may discuss the value of particular generic attributes, how this is actually played out in their teaching may be different. So while certain beliefs may be central to a person's values, they may not necessarily be directly enacted in teaching and this paper explores the reasons underlying this tension in the case of generic attributes.

The notion of differences between espoused theory and practice in higher education has a long history and there has been a considerable amount of work in this area from a range of perspectives (for recent examples see Fanghanel 2004; Kane et al. 2004; Sandretto et al. 2002; Trigwell et al. 2005). The notion of the difficulties of practice with regard to generic attributes was outlined by De La Harpe et al. (2000) who point to staff resistance to a 'top-down' approach, time pressures and lack of skill and confidence. Crebert (2002) also identified resistance and significant disciplinary variation in the interpretation of generic attributes. This study, by focusing on disciplinary interpretations of generic attributes, unpacks some of these issues. It points to the complexity of teaching generic attributes and to the issues inherent in universities that contribute to incoherence between ideal notions and practical application. While there has been work both on the notion of espoused theory and on the disciplinary nature of generic attributes, this paper brings together these two ideas to explore the reasons why, despite the level of interest in generic attributes, they remain idealised rather than realised in practice.

An investigation of generic attributes in their disciplinary context

This study is located within a qualitative methodology and is based around the assumptions of naturalistic inquiry (Lincoln and Guba 1985) since the study sought to uncover the meanings of interactions and in so doing develop an understanding of the relationship between ideas and their context. The data is largely emic as it is based on the under- standings of generic attributes from the insiders' perspectives (Lincoln and Guba 1985; Merriam 1998). As a consequence this research is concerned with the meanings the par- ticipants themselves attribute to interactions (Marshall and Rossman 1999). Five disciplines were selected for this study. The disciplines were chosen because they had an established disciplinary culture and so the relationship between the disciplinary context and the construction of generic attributes could be investigated. Yet it needs to be acknowledged here that an examination of more interdisciplinary fields may have revealed different results. The three attributes focused on in this study are critical thinking, problem solving and communication. These attributes were chosen because they are the areas that are consistently referred to in the literature both from the perspective of the aspirations of higher education and employer groups. It can be argued that problem solving is one form of critical thinking, however, for the purposes of this study the two are considered sepa- rately. The definitions of and relationship between these attributes are highly complex and have been examined in detail elsewhere (Alexander and Judy 1988; Baron and Sternberg 1987; Ennis 1987; Hager et al. 2002; Holmes 1995; Kurfiss 1988; Lohrey 1995; Marginson 1994; McPeck 1990; Misko 1995; Nodrvall and Braxton 1996; Perkins and Salomon 1994; Smith 1992). However, the focus of this study is on the ways in which these attributes are defined by the participants.

This study is based on in-depth interviews with 37 academic staff in two large, research- intensive Australian universities. In addition to interviews, copies of assessment tasks, subject outlines, lists of generic skills/attributes included in subject objectives and department versions of university graduate attributes were collected. Academic staff in each discipline were selected to allow for a broad range of specialisation or area of interest. Further, in selecting participants, the aim was also to have a range of age, experience and position level. Initially six people from each discipline were selected (three from each institution). Further interviews where then conducted if there were particular staff members who were not standard research/teaching academics but had a particular role in the teaching of generic attributes. A total of six participants were interviewed in history, seven in physics, eight in economics, seven in law and nine in medicine. Each interview was between 50 and 90 min in length. Interviews were semi-structured to allow for exploration of individual thinking. Interviews were audio recorded and transcribed in full. Analysis was emergent and coding involved re-reading and validation through cross-checking across all transcripts. From the initial coding, themes or patterns were identified and refined. Hypothetical relationships identified in the initial coding were confirmed, modified or rejected on the basis of this process. The potential for a gap between espoused theory and theory-in-use was investigated by asking participants about their construction of a par- ticular set of generic attributes and then how these were actually taught and assessed. As a follow up to this, participants were also asked whether they perceived any inconsistency regarding their aspirations for generic attributes and the ways this operated in practice and to discuss some of the reasons underlying this. Lists of generic attributes for the institution, department and subject were considered, subject outlines, teaching materials and assess- ment tasks were examined to gain insight into the ways in which particular attributes were taught. In addition to the formal interviews, the researcher had a number of informal

conversations with a range of people from each of the disciplines to gain some background into the culture of the disciplines and into the educational issues that were pertinent to each area. Furthermore, the findings were sent to each of the participants to ensure that their views had been accurately represented. The findings were also sent to non-participants in each of the disciplines to confirm that they 'rang true'.

Generic attributes as espoused theory

This study identified some dislocation between the espoused theory described by the participants and their teaching practice with regard to generic attributes. While attributes such as critical thinking, problem solving and communication are valued by academics and seen as part of the structure of their discipline, they are often not explicit in teaching. This inconsistency was discussed with the participants and the four reasons identified by participants across all disciplines are:

- A tension between content and skill, and the priority given to technical competence;
- Practical difficulties (i.e. large classes, time constraints);
- Resistance on the part of academics to practices that are perceived not to be integral to the discipline (i.e. imposed from outside)
- Resistance on the part of students to uncertainty and ambiguity.

The incongruity between espoused theory and theory-in-use with regard to generic attributes will be discussed in each of the disciplines separately. The attributes considered in this study, critical thinking, problem solving and communication are not considered to be discrete entities, however, they are referred to separately for ease of analysis.

History

Critical thinking and communication are identified as the key generic attributes by the participants of this study. Critical thinking is understood as an examination of evidence, the ability to understand complexity and ambiguity, an awareness of political and ideological dimensions and a questioning of received wisdom. Communication is largely understood as written communication, in particular essay writing, although speaking skills such as giving presentations and the ability to discuss an idea are also considered to be important. Problem solving is not considered to be a particularly important part of the teaching of history unless it is in the form of 'discuss the causes of the French Revolution'.

The discussion with historians in this study shows that critical thinking, analysis and communication are highly valued by historians and are an integral and central part of the epistemology of the discipline. These skills are part of what it is to be a historian and are central to teaching and assessment practices, but they are often tacit and not always taught overtly (particularly in the case of writing). So students may be expected to acquire some of these skills in the course of learning history rather than being taught the skills and attributes overtly but the expectation is that when they graduate they will be adept at critical thinking, certain forms of problem solving and communication, particularly writing. Moreover, because these skills are very much part of what it is to be a historian, they are shaped by understandings of what history is—these skills or attributes *are* history and mastering them is much of what it means to be a historian.

Paradoxically though, generic attributes are also seen as separate from the disciplinary context. These are entities which are referred to as 'generic' attributes and hence are not

part of the business of teaching history and so there is a perceived tension between teaching history and teaching these attributes. This is because although historians have always taught critical thinking, analysis and synthesis as *part of* history, there are also 'generic' attributes which are perceived as external to the discipline and introduced into teaching from outside (through directives from the Dean, Head of Department or teaching committees). As they are perceived as being external, they are resisted. They are given rather cursory attention since they are viewed as bolted on to subject outlines in a way that demonstrates lip service rather than involving any substantive acknowledgement that these attributes are part of the discipline itself. Thus there is no single way in which generic attributes are viewed in history but rather they are seen in complex and often contradictory ways.

While the teaching of generic attributes such as critical thinking, analysis and writing are important for historians and although these attributes fit relatively seamlessly into the epistemology of the discipline itself, there are tensions between what historians value and what they actually teach. The first tension is this conflict between content and skills (discussed earlier) which exists despite the fact that these attributes are part of the disciplinary culture.

The second mitigating factor is the practical difficulty in actually teaching attributes such as critical thinking or communication. The teaching and assessment of critical thinking is acknowledged to be problematic and its complex nature means that students are not always taught in a systematic manner—'I don't think I was ever taught in a systematic fashion how to read or think critically. It was something you picked up along the way.' The assessment of critical thinking and the assessment of writing are acknowledged by the historians in the study to be difficult for a number of reasons, in part because critical thinking is difficult to define and 'pin down' and so difficult to assess precisely. Critical thinking is usually assessed in history through essay writing but large student numbers and lack of staff time to provide detailed feedback on essays mean that while academics see going through essays as an important part of student learning, this is becoming increasingly difficult because of the sheer numbers of students, combined with an increase in other pressures. Others write extensive comments on student essays but this is very time consuming in large classes. In many classes, particularly the larger ones, marking is done by tutors (mostly postgraduate students) rather than by the subject co-ordinator. While guidelines are provided for the tutors doing the marking, academics argue that they have lost control of the feedback process since postgraduates have much less experience in marking and consequently there is a danger that assessment does not always fulfil its goals. Many historians argued that it was only the students doing honours or postgraduate study who really learnt how to write because in that situation they got one-on-one teaching and extensive practice in writing. Hence, although they saw writing as important, all worried that it was one of the casualties of a crowded curriculum and crowded lecture theatres. 'We don't have enough time to teach them these skills and teach history as well. This is one of the problems with mass tertiary education.' Another, referring to some of his colleagues, remarked:

> Some academics do not consider it to be their role to teach students to write. I understand the frustrations of people who spend their time reading work that is full of misspellings or is ungrammatical or poorly structured.

Similarly with oral communication, the historians argued that although speaking skills were a valued part of history, large classes and limited time meant that it was not always

well taught. So there are pragmatic constraints to the teaching of generic attributes in history.

The tension between content and skill also appears to be a consequence of the top down imposition of statements of generic attributes onto subject outlines. Because these are not framed as part of the disciplinary content but are seen as extraneous they are resisted, despite the fact that higher order skills such as critical thinking, analysis and communication are an integral part of history. One explanation for this may be that as Barrie (2006) suggests, some teaching staff view generic attributes as complements to disciplinary understandings rather than as aptitudes that lie at the heart of scholarly knowledge.

Further, there is a prevalent argument that students are 'extraordinarily resistant' to being challenged and it is difficult to make students engage in a critical way with the fact that the history they are reading is not just about accumulated information but is actually an argument.

Physics

Problem solving is the key generic attribute in physics and is understood as: hypothesis development and testing; the use of mathematical modelling to describe and analyse the physical world; and the awareness of issues of precision, accuracy and rigour. Problem solving is taught overtly and systematically and students are given a range of opportunities to see problem solving modelled and to practice it in laboratory, classroom and private study settings. Problem solving is central to assessment. Critical thinking and communication are seen as important parts of the research culture of physics but are treated with ambivalence by the physicists in this study when discussing undergraduate teaching. Critical thinking includes: the examination of rigour, accuracy and uncertainty; examining the predictive powers of a model or explanation; developing an awareness of the areas of controversy and debate in physics. However, teaching these ideas to undergraduates is considered by the physicists to be challenging, for the reasons outlined below. Communication, in particular the writing of laboratory reports and the presentation of posters is also considered to be an important skill, but one that sometimes gets neglected and it has a secondary place in assessment at the undergraduate level.

As with other disciplines in this study, there is a perceived tension between the importance of generic attributes and the need to teach subject specific content. Problem solving and analysis are relatively unproblematic as they are seen as being integral to the nature of the discipline (at undergraduate level) and are taught explicitly and students are given many different opportunities to practice the various forms of problem solving that are valued by physicists. Critical thinking and communication on the other hand are seen as being less straightforward to teach. This was in part a result of the assessment system, partly the segmentation of subjects and partly the nature of the subject matter itself.

The difficulties in teaching critical thinking are freely acknowledged. One participant remarked 'we are such traditionalists, we are probably awful! [at teaching critical thinking]'. Another thought that physicists are weak at teaching critical thinking since 'much of the material is presented as right because this is the physics we know, it is so well established. Even though we try not to do that'. Another physicist argued that 'critical thinking is a challenge in a mature, sequential field like physics because a lot of things are fairly incontestable'. As a consequence this can give students the impression that everything is known, which participants vigorously pointed out is not the case. Others pointed to the tension between content and skills, arguing that physics is such a huge body of

knowledge which takes years to work through, in addition to learning the mathematical skills, so there is little space for critical thinking in the undergraduate years.

So while communication and critical thinking are seen as important, a combination of large classes and the technical complexity of the material means that students are not necessarily exposed to these to a great extent until the honours year (which most students do not do). At this stage they can be exposed to problems to which there are as yet no answers or to material that is more complex and controversial. They suggest that it is only once people start to do research or are exposed to industrial problems that a physicist is faced with problems that are truly open, yet students are probably not aware of this unless they do honours or postgraduate study. As the process of becoming a research physicist is one with a very long period of maturation, students with a pass degree in physics have only very basic skills. It is not until they reach honours and more particularly PhD level that students develop more sophisticated skills in presenting a paper, writing an extended piece, solving complex open problems, synthesising and thinking critically about the nature of the material they are examining. This has changed to some extent, particularly in the case of communication, as students are giving talks, presenting posters, writing laboratory reports and so on. However the physicists in this study acknowledge that with large, lecture style classes this is not always easy. Critical thinking and communication are integral to the discipline and the physicists are wary of presenting knowledge as uncontested yet acknowledge this as a challenge.

The physicists in this study referred to the constructed nature of knowledge, the bizarre, counter-intuitive and often highly contested nature of some of the frontier physics and the extent to which theorising and critical and creative thought play a vital role in research. Yet when they discuss the role of generic attributes in an undergraduate degree their concerns are evident.

Economics

In economics, problem solving is the key generic attribute. This is understood as the use and application of economic tools for both theoretical and 'real world' problems. As with physics, students in economics are given a range of opportunities to see problem solving modelled and to practice it in classroom and private study settings. Problem solving is central to assessment. For most of the economists in the study, critical thinking at undergraduate level is synonymous with good problem solving in that it is the ability to analyse the appropriate use of a particular model or set of tools and an examination of the validity of economic reasoning. Communication skills, in particular writing are described as important but are not overtly taught and have only a minor place in assessment.

Although the economists agree in theory that generic attributes are important, and identified critical thinking and communication as among the key skills, there is an inherent tension in economics between disciplinary knowledge and generic attributes and, with the exception of technical problem solving, these are considered to be separate and in conflict in undergraduate teaching. As a consequence, the need to focus on teaching the technical skills is paramount. In the words of one participant:

> You can't base a course on generic skills so you start off with the subject matter and then rationalise the generic skills after that. You don't design a course so you teach communication skills. They are secondary.
> Teaching communication is more indirect than direct. We have written assignments and debates but we are probably not providing a lot of training in terms of developing

those skills. We are saying it is important and we assess it but unlike analysis or problem solving, where I think we provide training.

Further, critical thinking is seen as being very difficult to teach:

A lot of us will talk about critical thinking and analysis and problem solving but they are like motherhood statements, we don't actually know how to do it or we think it sort of wears off on students. I guess to some extent if you expose them to enough of this, seeing other people doing it and force them to confront particular issues then eventually they will—but a lot don't. I am not sure how to do it directly.

Expanding on this, many acknowledge the practical difficulties of teaching critical thinking in large classes. Others felt that students wanted 'diagrams that they could memorise' and that:

They [students] want to compartmentalise and a very common question is how much of this bit do we need to know for the assessment. Not even how much of the subject but which lectures.

If we return to Barrie's (2006) analysis, we can consider that for many of the teaching staff in economics, generic attributes are seen as separate from the disciplinary knowledge, either as precursory or complementary skills rather than as aptitudes that are central to the scholarly knowledge in the discipline.

Law

Critical thinking, problem solving and communication are all identified as very important by academics teaching law. However, there is a level of inconsistency between what is valued and what is explicitly taught. Critical thinking is understood as: the examination of an argument, its evidence and logic; the examination of assumptions; a discussion of the social context of an issue, an awareness of ethical issues; and a questioning of received wisdom. Problem solving is the practical application of critical thinking, often to 'real world' problems and so is particularly concerned with outcomes. Problem solving was described as 'classic law school stuff' and was a major part of assessment. Writing, while seen as important, was described as difficult to assess well in large classes. This was even more apparent in the case of spoken communication, which was seen as a very important skill for a law graduate but was rarely explicitly taught and even less often assessed.

Like the other disciplines investigated in this study, although the generic attributes identified are perceived as important, the difficulty in teaching them is acknowledged. As several participants point out, it is difficult to teach skills without assessment and the assessment of complex skills such as critical thinking is problematic. While exams are a satisfactory way of assessing problem solving, they do not assess critical thinking well as they do not give time for research or reflection. Essays are seen as a much better way of both teaching and assessing critical thinking yet as with history, there are practical problems associated with marking large numbers of essays with limited staff time. Many staff felt that they did not have the time to give detailed formative feedback on written work or to assist students with drafts in ways that would develop students' writing skills and their reflective critical skills. Spoken communication was an even greater problem and was seen as almost impossible in large classes. It was taught and assessed in very small classes in latter year subjects and in the optional professional program at one university. However, much work that had once been part of the formal curriculum such as mooting

and negotiation skills was now carried out as an optional activity by the Law Students' Society.

Another problem identified by some of the law academics is that students are assessment-driven and so are only interested in material that is going to be 'on the exam'. Unless critical thinking can be overtly tested, it is argued that students see presenting too much critical material in class as a waste of time and are resistant to it. Some law academics suggest that students are very passive and wait for the teacher to provide the answer. As one person commented:

> Getting [students] to focus on the problem rather than the answer would be nice. In a perfect world they would love problems and think the answers were secondary but it doesn't really work like that. I want to teach them the value of the question, to revel in the question, to play. That is so important but hard to do, really really hard to do, to get them off the sample answer, that there has to be a right answer. They don't like ambiguity.

Another added 'they want clarity, they want a set of bullet points, they want to know exactly where to find the information'.

Law academics argued that while it is important to have the ability to think critically and solve problems laterally, the silo nature of the subjects worked against this, as did large classes, time-pressured academic staff and also, possibly, the changing student population and student expectations of the nature of university education.

Medicine

The key generic attributes in medicine are critical thinking, problem solving and communication and these skills are seen by medical educators as highly integrated with the discipline. Problem solving in medicine takes the form of clinical reasoning, a subset of critical thinking and is the systematic thinking around diagnostic and therapeutic skills. Critical thinking encompasses: the understanding of evidence based medicine; awareness of ethical issues; reflection on the role of the professional; and a questioning of received wisdom. Communication, particularly oral communication is highly valued. All these skills are integrated into the curriculum and are taught and assessed.

While the medical academics in this study have a keen interest in the role of generic attributes in medical education they argue that there are many within medicine, both in clinical and university settings who may view matters differently and hence would teach students in a very different manner.

A number of difficulties in teaching critical thinking are acknowledged. First the pressure of course content because 'the curriculum gets packed with factual knowledge and practical skills'. As one person remarked, 'We haven't got time to debate too much and think too much and reflect too much because you have to cram this amount in and get through the content'.

Critical thinking is acknowledged to be difficult to assess. It is assessed through the OSCEs[1] and reflective journals and in the case questions on examinations. Yet these are seen as imperfect assessment tools for critical thinking. Further, it is acknowledged that sometimes assessment is driven by 'what is convenient or easy, things you can put in simple questions'.

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[1] Objective structured clinical examination. It is a task-based oral exam in which students undertake a number of simulated practical situations.

Another problem is that while critical thinking is important, teachers are reluctant to destroy students' idealism or their sense of agency. As one participant pointed out, it is acceptable for sociologists to examine and critique in detail but medical students will be in a situation where they have to take action, often in less than perfect situations. While it is important for them to be aware of the imperfections, they still need to operate within them and hence they are reluctant for students to become 'paralysed post-structuralists'. Critical thinking requires doctors to take action and to engage. As part of this process teachers are concerned that they do not just 'knock down their sense of certainty and leave them with a total sense of uncertainty without a way of exploring and understanding'. A further issue was that the hierarchy and the socialisation puts pressure on students' critical thinking, particularly in a hospital setting where 'a direct challenge to authority gets stamped on, sometimes in a very nasty way'. Many of the doctors in this study argue that while they consider it as crucial to admit that they did not know something, this was not the traditional culture of medicine and sometimes they risked their professional reputations by doing this.

Another concern is that some students are resistant to thinking critically, a concern allied to the concern regarding students' need for certainty. As one participant stated:

> For some students, science and education is 'tell me what I need to know, what I need to regurgitate, tell me what the facts are and I will spit them back at you during the exam, that is knowledge for them'.

However, he acknowledged that it was up to teachers to encourage critical thinking and that 'students cannot be expected to have minds that are any more open than the minds of their teachers'. He remarked that universities are not always as good as they could be at encouraging debate, challenging students to think and presenting them with different models and ways of thinking, of examining the evidence and thinking for themselves.

Nevertheless, while participants voiced some concerns about the extent to which teaching of generic attributes was effective, there was much less tension between skills and content than was identified in the other disciplines in this study. The problem-based or case-based mode of education means that the notion of a division between skills and content is reduced in medicine as skills and content and integrated. Medical educators have attempted to carefully deconstruct key skills such as clinical skills so that they are built up over the course of the degree. Furthermore, there is a definite attempt to overtly integrate content and skills in the curriculum. Skills such as critical thinking and problem solving are seen as part of clinical skills and as such are an integral element of the degree. Content knowledge and skills are not seen as competing but as connected. The participants in this study argue that using the PBL approach, it is much easier to integrate skills and knowledge since in the traditional approach to learning students are learning material in a discipline context and then trying to put it together in quite different contexts. A case-based curriculum allows students to develop skills integrated into content and in a range of contexts.

Barriers to the teaching of generic attributes

There are a number of possible explanations for the inconsistency between belief in the idea of generic attributes and an absence of systematic teaching and assessment of these attributes. However, teachers can believe one thing about knowledge and teach in ways that imply another (Beers 1988; Schommer and Walker 1995). One reason is that with regard to teaching, generic attributes have become separated from notions of the scholarly

pursuit of the discipline and so have become de-disciplined. When academic staff consider the nature of their discipline and their own research practices they consider attributes such as critical thinking, analysis, problem solving and communication to be central. However, in their teaching, generic attributes are often viewed as separate from the central business of the discipline. This is not the case in medicine, and here attributes such as critical thinking, problem solving and communication are considered not as generic but as central and integral to the discipline and to professional practice. This is also the case for economics and physics where problem solving is taught as a key part of the disciplinary content, and in history where critical thinking is modelled as being part of what it is to be a historian.

Barrie (2007) identifies qualitative differences in the ways in which academics conceptualise generic attributes. He argues that:

> variation in what academics understand generic attributes to be helps in part to explain the reasons for the limited implementation of graduate attributes within university courses… [since] if academics do not understand their institutions' espoused generic attributes of graduates to represent relevant, important university learning outcomes, they are unlikely to incorporate them in their courses or teaching (p 441).

In discussing the range of academics' conceptions of how students develop generic attributes, Barrie identifies two views which describe generic attributes as either irrelevant or separate from the curriculum—a *remedial* conception, which views generic attributes as not the responsibility of university teachers nor part of university teaching and an *associated* conception which views generic attributes as an isolated subset of the discipline. This is in line with the findings of the present study which argues that one of the factors in the uneven implementation of generic attributes is that they are not seen integral to the core business of university teaching. Those attributes which were seen as central were (largely) the attributes which were taught.

The notion of generic attributes as separated from disciplinary thinking has lead to a tension between skills and content that has been identified in a number of studies (Assiter 1995; Bath et al. 2004; Edwards and King 2002). Edwards and King (2002) found that generic attributes were seen as a competitor to content and the way of managing this tension was to embed the skills within content. However, the consequence of this was that generic attributes disappeared into disciplinary knowledge and so were not given any explicit attention even though academic staff argued that their discipline was founded upon these attributes. When generic attributes are seen as integral to the subject they are often not overt. For this reason they are either tacitly included in teaching or are assumed to be skills which students already possess. Thus, even when these attributes are taught, they are not always articulated.

A further issue is the lack of clarity regarding the nature of generic attributes, which means that there is uncertainty on the part of teaching staff as to what these terms referred at the undergraduate level. In addition, these concepts have multiple interpretations and so the meanings are different both within and across disciplines (Jones 2007). Thus there is no single way of understanding the notion of 'critical thinking' or 'problem solving' but rather a range of interpretations that are very much bound up with the context in which they are taught.

Practical difficulties such as large classes and time pressured academic staff also work against the teaching of attributes such as writing, speaking and critical thinking. This is because these skills require formative assessment such as essays, open-ended problems or

class presentations that often require considerable input from teaching staff. In addition, given that these attributes are difficult to teach and assess, when there are few rewards for good teaching, the teaching of generic attributes may be over-ridden by the teaching of more concrete aspects of the subject. Further, there is a deeper resistance to the overt inclusion of generic attributes in teaching as they are perceived to be part of the bureau-cratisation of universities and the erosion of disciplinary and teacher authority. Generic attributes are viewed by some teaching staff as irrelevant checklists, which are imposed upon the 'real' (disciplinary) content.

The reported resistance on the part of students to conceptual skills such as critical thinking is a very complex issue. The present study did not examine student perceptions and so any discussion of student views regarding generic attributes and the tasks that engender them is beyond the scope of this paper. However, there is evidence in the literature (McInnis 2001) which suggests that students are spending longer hours in paid employment, less time on campus and are increasingly strategic in their approach to study. If this is the case, and if the more complex and ambiguous skills such as critical thinking are not rewarded by assessment then any resistance to the acquisition of complex con-ceptual skills and attributes will be magnified. While there are many factors that may be working against the teaching of skills such as communication (in various forms) and critical thinking, if these are skills that are truly valued by the community (at a societal as well as employment level) then universities may need to consider ways in which to create an environment where these skills and attributes are explicitly valued, taught and rewarded.

One of the problems with generic attributes identified by participants in this study is that they can be viewed as either generalised statements without substance or they can be overly prescriptive. Lists of generic attributes were added to subject outlines by some academic staff in response to departmental policy rather than because they were seen as having intrinsic value. Clegg and Ashworth (2004), writing about the pressures for accountability, argue that notions of transparency assume that teaching practice can be made readily accessible to staff, students and administrators. Hussey and Smith (2002) make the point that descriptors of learning outcomes cannot adequately capture the complexity of teaching and learning in the classroom. They argue that learning outcomes are based on a fundamental epistemological confusion between Rylian notions of 'knowing how' and 'knowing that' since the attempt to specify learning outcomes involves trans-lating the knowing how of teaching practice into knowing that type statements. Hussey and Smith (2002) found that the oversimplification which is implicit in statements of generic attributes and their inclusion in subject outlines as learning objectives is part of the reason why academics are resistant to them. This resonates in the present study as several par-ticipants referred to the fact that generic attributes had become mere checklists which they added to their subject outlines because this was a requirement rather than because they saw any educational value for their students. These lists are perceived as oversimplifying the very complex nature of the attributes. Yet at the same time many academics spoke with enthusiasm about the role of critical thinking and problem solving (in a disciplinary context) as part of the subjects that they taught and as part of the knowledge structure of their discipline. One explanation for the degree of resistance to the notion of generic attributes is that they have become associated with a managerialist culture of audit and control. Morley (2003) describes this in terms of the 'quality' movement and the requirement to describe complex practices such as teaching and learning in terms of simple classifications which then become tools of evaluation of quality and performance. If generic attributes are perceived as instruments of control rather than integral to the dis-cipline they may be resisted.

From the findings presented above, a typology of the barriers to the teaching of generic attributes is summarised here:

- Epistemological: generic attributes are not considered to be part of disciplinary knowledge;
- Cultural: generic attributes are not seen as one of the central roles of the university teacher;
- Intrinsic: generic attributes are complex and difficult to define;
- Pedagogical: there is a lack of understanding regarding the nature of attributes, a lack of experience of, or confidence in teaching these attributes;
- Structural: large classes, the teaching of generic attributes is not actively supported by departments, top-down implementation, lack of time, emphasis on research rather than teaching.

So while attempts to make generic attributes clear are valuable, a detailed understanding of the subtleties of disciplinary culture avoids the pitfall of making generic attributes too prescriptive and prevents the creation of something that is so simplistic that it does not capture what is really happening in teaching and learning. For competent practitioners 'knowing in practice' is mostly tacit (Schon 1983). One of the problems with the current notion of generic attributes is that it assumes that they are observable and measurable (Holmes 2000). Yet if generic attributes are inherently bound up with knowledge, then the idea of measuring or mapping them is more complex than much of the earlier discussion of generic attributes in the literature would suggest.

Conclusion

This paper has shown how incoherence between ideal and acted notions of generic attributes can be identified. In particular this paper has shown how these incoherences derive from competing understandings around the nature of generic attributes and their place in higher education and also derive from epistemological, structural and cultural factors. This study, by examining the relationship between disciplinary epistemology and notions of generic attributes, found that when generic attributes were conceptualised as integral to the disciplinary content and culture (for example problem solving in medicine, economics and physics, communication in medicine, writing and critical thinking in history) they were either deliberately and systematically taught or at the very least assessed (Jones 2007). The findings of this study are in line with earlier studies which outlined the complexity of generic attributes and argued for the need to engage with a more complex and critically reflective approach (Bath et al. 2004; Sumsion and Goodfellow 2004). Furthermore, the findings of the present study examine some of the reasons behind earlier findings of gaps between espoused beliefs about generic attributes and the practical applications (Crebert 2002; De La Harpe et al. 2000). In setting out a typology of the barriers to teaching generic attributes this paper argues that they are highly complex and influenced by a range of contextual factors. (Kember et al. 2007) in their study into the teaching and learning environments that enhance skill development identify a number of factors including active learning, teaching for understanding, feedback, teacher-student and student-student interaction and assessment. Hence promoting good teaching promotes the learning of generic attributes.

The reasons underlying the barriers to teaching generic attributes are multiple and reflect the practical constraints on teaching in contemporary higher education and on the complexity of generic attributes. While the practical constraints are significant,

underpinning this is the fundamental nature of attributes such as critical thinking and problem solving as integral to disciplinary thinking. As Willingham (2007) has pointed out 'critical thinking is not a skill. There is not a set of critical thinking skills that can be acquired and deployed regardless of context …. The ability to think critically … depends on domain knowledge and practice'. Because of their fundamentally contextual nature, generic attributes are part of the discourse of disciplinary knowledge. Other factors such as pedagogical practice, practical constraints, cultural meanings attached to the role of the academic are then overlayed onto the complex structure of generic attributes, resulting in a gap between what is valued and what exists in teaching practice. Considering generic attributes as separate from disciplinary knowledge and hence in competition with it rather than integral to it is at the heart of the problem.

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