RESEARCH-INFORMED TEACHING PROJECTS:

Pedagogic Research Project –
Impact of Enquiry-Based Learning

And

Longitudinal Pedagogic Research Project –
Student Perceptions of Research-Informed Teaching

Final Report

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Executive Summary

This report presents an analysis of pedagogic research completed at Staffordshire University that (i) aimed to investigate the current extent and impact of enquiry-based learning on students learning, and (ii) aimed to investigate students' perceptions of research-informed teaching. Work has concentrated on qualitative and quantitative analysis of data provided by students/staff from seven 'enquiry-based' modules. These were drawn from six different departments/faculties across the University and covered a range of academic levels:

1	Studying Society	Sociology Department	Level 1
2	Project Preparation and Planning	Geography Department	Level 2
3	Critical Thinking in Management	Business School	Level 2
4	Psychology Project	Psychology and Mental Health	Level 3
5	Evidence Based Practice in Nursing	Health Professions	Level 2
6	Criminology	Law School	Level 2 or 3
7	Exploring Psychology	Psychology and Mental Health	Level 1

KEY FINDINGS

- Lecturers interpret the University learning outcome statements in very different ways. There is no consistency in the way learning outcomes in module descriptors are categorised in relation to 'enquiry' and 'problem solving'.

- Whilst lecturers agree that the enquiry is a key graduate outcome, interviews indicated wide differences of opinion as to what this means.

- Enquiry modules in different subjects give very different weights to (a) developing specific study techniques; (b) understanding the method of enquiry in the subject; and (c) developing critical thinking abilities. These differences are associated with different emphases on induction into an academic community and preparation for work.

- Students taking 'research-based' enquiry modules (those where students are actively engaged in research projects) were more likely to feel that taking the module was important for their degree.

- Students understanding of the development of knowledge within their discipline varied considerably across modules; Critical Thinking in Management students had the most sophisticated knowledge in terms of interpreting research questions or developing a research argument. This is likely to be because a large component of this module is concerned with teaching students critical appraisal skills.

- Whilst module assessments convey the intentions of lecturers, these are not always understood and acted upon by students. Unsurprisingly, students' understanding of the

assessments was to some extent related to the amount of support a student received from their supervisor.

- The impact of enquiry modules is severely limited by insufficient complementarity with other modules students are taking. If other modules do not explicitly draw upon students' work in enquiry modules then the likelihood of genuinely developing students' critical thinking abilities is substantially diminished. This problem is pertinent to the design of assessment. For example, in one enquiry module students were learning and developing research skills but did not have opportunities to develop or have these assessed in other modules due to the style of assessments in these other modules (note that this problem can be attributed in part to the variety of interpretation in module outcome statements regarding enquiry). Despite this, there was evidence from interviews with students that they were attempting to transfer their enquiry learning to other modules.

- Some students failed to use Blackboard to its full advantage, preferring information to be handed out in class. This was partly related to a lack of information about Blackboard in general. There was, however, also a lack of motivation to find out how to use Blackboard. Overall, the results demonstrate a preference for being 'spoon-fed' information, as opposed to proactively seeking it.

- The Evidence Based Practice module employed structured critical appraisal tools (see Pages 29-30) which were particularly useful for helping guide students' critical appraisal skills.

- Students become steadily more appreciative of the value of taking enquiry modules as they progress in their studies. This means that student evaluations at the end of enquiry modules tend to underestimate how useful they find them.

- The quantitative results indicate that in order to achieve a high level of critical thinking ability it is important to have sophisticated epistemological beliefs.

- Students' baseline epistemological beliefs scores (i.e. those taken at the start of the enquiry-based modules) indicate that Business students taking the Critical Thinking in Management module have significantly less sophisticated epistemological beliefs than do students taking other modules. (The finding that Business students tend to have rather weak epistemological beliefs has been found elsewhere in the literature).

- There were no significant differences between modules in students' levels of critical thinking ability. Students' baseline critical thinking abilities (i.e. abilities assessed at the start of the enquiry-based modules) were low for all students, whatever the module taken.

- There was no significant improvement in critical thinking abilities or epistemological beliefs across the period of the modules. Nor was there any significant change in the relationships between critical thinking abilities and epistemological beliefs. These results suggest either that our quantitative measures are too weak to be picking up

significant effects, or that the teaching on the modules is not making any significant difference to students' critical thinking abilities or epistemological beliefs.

- Correlations between variables suggest that the types of assessment for the enquiry-based modules are requiring sophisticated epistemological beliefs, but are not requiring particularly high critical thinking abilities. In contrast, the types of assessment for other modules on a students' award are requiring good critical thinking abilities, but are not requiring sophisticated epistemological beliefs.

1 Introduction

This report on the Research-Informed Teaching Projects, prepared by the Institute for Education Policy Research, Staffordshire University, presents an evaluation of work completed at Staffordshire University during the 2006/2007, 2007/2008 and 2008/2009 academic years. The evaluation presents an analysis of pedagogic research which (i) aimed to investigate the current extent and impact of enquiry-based learning on student learning, and (ii) aimed to investigate students' perceptions of research-informed teaching.

1.1   Background Information

All 'non-research intensive' HEIs are being encouraged to develop their provision of 'research-informed teaching'. Dedicated funding has been allocated to these HEIs, including Staffordshire University, in order to develop practice, and funding is being used to support development projects in research-informed teaching which colleagues are engaged in across the university. Alongside these developments, Staffordshire University aimed to review the ways that students develop their 'enquiry skills' through modules that have been specifically designed to focus on this purpose. There are two main purposes of conducting a review of such modules:

1. To provide the University with a critical review of its provision for enquiry-based learning in the context of research-informed teaching, and to facilitate the spread of interesting practice and thinking across the University.

2. To provide opportunities for colleagues involved in planning and teaching modules that have a strong element of enquiry-focused teaching to compare course planning, practice of teaching, and assessment of outcomes with regard to the development of students' abilities in relation to enquiry. It is intended that outcomes of such comparisons might provide a stimulus or even in some cases a template for revising some aspects of current practice.

'Enquiry' may well look fairly different from one part of the university to another. Nevertheless, statements in quite a large number of current module descriptors (module specifications) are worded in ways that assume that the ability to enquire is generic. An example would be:

> *'Understand the process of critical reasoning and employ that understanding in support of the student's personal development as a learner'.*

It is not obvious which faculty this comes from. Similar statements could have been taken from modules in any faculty. We might anticipate some degree of consistency in the way that terms such as 'critical thinking' and 'beliefs about knowledge' are used. However, it is not clear that anything approaching consistency exists. For example, it is not easy to judge whether this statement comes from a Level 1, 2, 3 or M Level module. Similarly worded

statements can currently, in fact, be found at *any* level. Moreover, there does not appear to be any consistency in the way that abilities to review and construct knowledge claims are labelled in module descriptors. All module learning outcomes have to be matched against a set of university defined categories such as *'Application'*, *'Problem-solving'*, *'Enquiry'*, etc. Learning outcomes such as 'Be able to *research* the demand for a good or service' are interpreted by some colleagues as an instance of *'Enquiry'*, but by others as instance of *'Application'*, and by others as an instance of *'Problem solving'*.

Of course, it is perfectly possible that the current array of learning outcome statements in module specifications bears only a passing resemblance to the purposes that direct lecturers' teaching and students' understanding of what that teaching is intended to achieve. It may be that everything is very clear at the point where it really matters. But it is also possible that sometimes students are less clear about the capabilities we want them to develop than they are about specific knowledge we want them to acquire. Maybe the language we have developed for expressing those intentions is less fine-grained than the language we use to present the subject and professional knowledge which we want them to become adept in using.

Comparing practice across the University should therefore provide opportunities for developing the way that Staffordshire University expresses its intentions about what capabilities it wants students to develop. Accordingly this report from the Institute for Education Policy Research reports on two closely related research-informed teaching projects:

1. An pedagogic investigation of the extent and impact on student learning of enquiry-based learning in order to:

   (i)   Identify and compare dedicated enquiry-based modules within current programmes within the university;

   (ii) Identify student outcomes from enquiry-based learning;

   (iii) Review the impact of teaching on student outcomes in enquiry-based learning and any changes to practice over the term of the study.

2. An investigation of students' perceptions of research-informed teaching.

1.2   Aims of the Research

The projects ran for three years and included analyses of data drawn from module descriptors, and staff and students for the academic years 2006/2007, 2007/2008 and 2008/2009. The 2006/2007 phase of the research focused on an analysis of module descriptors for modules offered to undergraduate students at Staffordshire University during this academic period. This phase of the research aimed to identify key modules within the University that are making a significant contribution to students' enquiry skills, thereby forming a basis for the following stages of the research.

The 2007/2008 and 2008/2009 phases of the research were comprised of both qualitative and quantitative analyses. These are discussed in turn below.

1.2.1 Qualitative analyses

Qualitative data collection was undertaken during the both the 2007/2008 and 2008/2009 academic years. The 2007/2008 phase of the research focused on groups of students taking four undergraduate enquiry-based modules at Staffordshire University during the 2007/2008 academic year. An additional two undergraduate enquiry-based modules were added into the sample base in 2008/2009. Interviews were conducted in order to determine students' perceptions of the modules, their understanding of lecturers' expectations, their understanding of the development of knowledge in their subject area, and the extent to which enquiry-based teaching has impacted on their knowledge creation and acquisition, as well as the extent to which students' learning has been transferred to other modules in their programme of learning. Specifically, the following issues have been explored:

- What is significant about the teaching or the students' experience of learning in the module?

- What variation is there within and across modules? What makes a difference?

- What impact has the module made on students' experiences as a student?

- What do students believe are lecturers' expectations of them in terms of the ability to generate and review knowledge in their field?

- To what extent are students using the outcomes of enquiry modules in their work on other modules?

- To what extent is the enquiry module linked to other modules on a student's award and do other lecturers on a student's award refer explicitly to the enquiry skills module?

1.2.2 Quantitative analyses

The quantitative stage of the research was undertaken during the 2008/2009 academic year and aimed to assess students on their critical thinking abilities and their levels of epistemological beliefs and how these related to students' academic grades. Both critical thinking abilities and epistemological beliefs are increasingly recognised as playing an important role in students' academic learning and the prediction of students' academic performance. One of the key learning outcomes of higher education is that students should be able to think critically about what they have studied (Kronholm, 1996). The Quality Assurance Agency for Higher Education (2007) consistently cites critical thinking within their benchmark statements for undergraduate and postgraduate disciplines. Good critical thinking skills require that students have a good grasp of formal knowledge and have the ability to apply logical argument and analytical, abstract and objective appraisal. Students who are able to achieve this state increase the probability of achieving the required outcomes that are the objective of an academic education.

Epistemological beliefs – the theories and beliefs people hold about the nature of knowledge and how they come to know – also play an important part in students' understanding of how to analyse, synthesise and evaluate material. Epistemological developmental frameworks posit that people view knowledge from different perspectives at various stages of their educational development (see Hofer, 2001; Buehl and Alexander, 2001, for reviews). In the early stages beliefs about knowledge are absolute, characterised by rigidity, and defined by authority; in the final stages they are based on reasoning processes using contextual evidence and appropriate rules of enquiry (Kember, 2001). It has been suggested that advanced epistemological development is an indicator of advanced critical thinking skills (Hofer, 2001; Kember, 2001; Kuhn, 1999; Moon, 2008). Such theorists argue that an awareness of epistemology is a prerequisite for critical thinking in higher education, both within and across disciplines.

This stage of the evaluation therefore aimed to answer a number of questions:

- Is there any meaningful relationship between undergraduate students' critical thinking abilities and epistemological beliefs?

- Are there any differences in critical thinking abilities and epistemological beliefs across different academic subjects?

- Are there any changes in critical thinking abilities and epistemological beliefs across the period of the modules under study?

- What is the relationship between academic performance, critical thinking abilities, and epistemological beliefs?

Quantitative data was obtained from students on six enquiry-based modules (five of the six modules explored in the 2007/2008 and 2008/2009 qualitative analyses and one additional module). Students' critical thinking abilities and levels of epistemological beliefs were examined at the beginning of the module and again at the end, in order to determine changes across time. Students' academic grades on these modules and on other modules they had taken during 2008/2009 were obtained from Staffordshire University Student Records. Students were also asked to provide the grades they achieved at GCSE.

2 Data Collection

2.1   2006/2007

During this period, data collection centred on identifying modules within the University that were making a significant contribution to students' enquiry skills. Dialogue with Directors of Teaching and Learning, together with a review of module descriptors for undergraduate awards across the University, identified a number of key modules to be entered into the analysis for 2007/2008 and 2008/2009. Meetings with Directors of Teaching and Learning also focused on procedures for contacting and involving key members of staff, as well as the design of a proforma for gathering data on enquiry modules. It was decided that both qualitative and quantitative methods of data collection would be utilised for the remaining stages of the research. These will be discussed in turn below.

2.2   Qualitative Data Collection (2007/2008 and 2008/2009)

Following meetings with Directors of Teaching and Learning and the review of module descriptors four modules were entered into the 2007/2008 phase of the research and two were entered into the 2008/2009 phase. This section outlines the data collection procedures as they were undertaken for these modules.

2.2.1   Sample

Six key modules identified as making a significant contribution to students' enquiry skills, were entered into the qualitative stage of the evaluation. These modules were selected from six different departments and from a range of academic levels. Modules were entered into the evaluation in one of two separate academic years; 2007/2008 or 2008/2009. The modules and the academic year relative to each one can be seen in Table 1. Table 1 also shows the department/faculty in which these modules are offered, the academic level and type of module, the semester the modules are taken in, and the number of credits each module carries.

Qualitative research methodology was used to answer the research questions outlined in the introduction. Initially, interviews were conducted with the module leaders for each module. Following this, interviews were conducted with a selection of students on each module. The pattern of interviews was different for the 2007/2008 cohort and the 2008/2009 cohort:

- For each 2007/2008 module two sets of students were interviewed; 'current' and 'past' students, i.e. students currently taking the module in 2007/2008, and students

who had taken the module in the previous year (i.e. the 2006/2007 academic year)[1]. Students were interviewed towards the end of the module. In total, 48 students from across the four modules took part in this stage of the research. Eleven students were also re-interviewed towards the end of the 2008/2009 academic year to determine longer term impact of the modules.

- For each 2008/2009 module only students currently taking the module in 2008/2009 were interviewed. Each student participated in two interviews; one at the beginning of the module and one towards the end of the module. The second of these was to assess whether students viewpoints had changed across the course of the modules. In total 15 students across the two modules took part in this stage of the research[2].

Table 1 Modules by department/faculty, academic level, semester, and number of credits per module

Year entered into study	Module	Department in which module offered	School or Faculty	Academic level and type of module (C = core, Op = option)	Semester module taken in	Credits per module
07/08	Studying Society	Sociology	Arts, Media & Design	1 (C)	1	15
07/08	Project Preparation & Planning	Geography	Sciences	2 (C)	2	15
07/08	Critical Thinking in Management	Business	Business	2 (Op*)	1	15
07/08	Psychology Project	Psychology & Mental Health	Sciences	3 (Op**)	1 & 2	30
08/09	Evidence Based Practice in Nursing	Health Professions	Health	2(C)	1 & 2	30
08/09	Criminology	Law	Law	2 or 3 (C or Op^)	1 & 2	30

* The Critical Thinking in Management module was an option module for the 2007/2008 academic year, but changed to a core module from 2008/2009.
** The Psychology Project is an option module but is essential for students wishing to receive British Psychological Society accreditation for their degree and is therefore taken by the majority of students.
^ The Criminology module can be taken as a core or option module depending on the award being studied.

For all six modules the final numbers of students interviewed constituted a minimum of 10% from each intake for each module. In total 63 students were interviewed, 69.8% of which were female. The numbers of students interviewed for each module and each intake are given in Table 2, together with the gender breakdown of students interviewed.

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[1] Only the current year's students for the Level 3 Psychology Project were interviewed as it was not possible to track students after they had left the University.
[2] One Criminology student declined to re-interviewed at the end of the module.

Table 2   Numbers of students interviewed by cohort (current and past students) and gender

Current cohort	Module	Total number students interviewed	Gender breakdown (% female)	Number of current students*	Number of past (06/07) students*
07/08	Studying Society	14	86.7%	7 (2)	7 (3)
07/08	Project Preparation & Planning	11	36.4%	3 (2)	8
07/08	Critical Thinking in Management	10	40.0%	5 (4)	5
07/08	Psychology Project	13	76.9%	13	n/a
08/09	Evidence Based Practice in Nursing	7	85.7%	7 (7)	n/a
08/09	Criminology	8	100%	8^ (7)	n/a
Total interviewed		63	69.8%	43 (8)	20 (3)

* Number of students who participated in the follow-up interviews in parentheses.
^ Five Level 2 and three Level 3 students were interviewed.

Students interviewed were on a mix of single and joint honours degrees. Table 3 shows the numbers of students on single and joint honours degrees for each module, together with some additional sample characteristics. As can be seen, the majority of students interviewed had English as their first language. There were also a number of 'mature' students in the sample (students over 21 who had been out of formal education for a number of years).

Table 3   Modules by numbers of students on single and joint honours degrees, mature students and those having English as a first language

Module	Number students in sample	Students with English as first language	'Mature' students^	Students on single honours degrees	Students on joint degrees (within the same faculty)	Students on joint degrees (from two separate faculties)
Studying Society	14	13	6	9	1	4
Project Preparation & Planning	11	11	2	4	7	0
Critical Thinking in Management	10	9	1	10	0	0
Psychology Project	13	13	5	7*	4	2
Evidence Based Practice in Nursing	7	7	1	7**	0	0
Criminology	8	8	2	3	5	0
Totals	63	61	17	40	17	6

^ Classified as students over 21 who had been out of formal education for a number of years.
* Includes one student on a Graduate Diploma.
** Includes two students on Graduate Diplomas.

2.2.2   Interview schedules

Interviews were conducted with staff and students from the chosen modules. Participation in the interviews was voluntary. All participants were assured that their responses to our questions would remain completely confidential and that any data reproduced in reports would be anonymised.

Staff interviews

Interviews were conducted with the module leaders for each module in order to determine their perceptions of the nature of enquiry within the subject area that the module was based in. In summary, schedules asked module leaders how they conceptualise enquiry learning, what type of enquiry they hope students will develop by taking the module, how enquiry learning is assessed in the module, and how they feel students relate to the module (see Appendix 1 for the staff interview schedule proforma). Interviews with staff members were conducted during the module as it ran in the 2007/2008 or 2008/2009 academic year, prior to the student interviews, and informed the development of the student interview proforma.

Student interviews

Interviews for the 2007/2008 cohort were conducted with students towards the end of the module as it ran in the 2007/2008 academic year. Interviews for the 2008/2009 cohort were conducted on two occasions; at the beginning of the module as it ran in the 2008/2009 academic year, and again towards the end. In developing the student interview schedules we tried to maximise faculty involvement so that the research exercise supports the development of Teaching and Learning that is being led within each faculty/department (see Appendices 2 to 5 for student interview schedule proformas for the 2007/2008 and 2008/2009 cohorts). To this end, not only did the module leader interviews inform the development of the student interview schedules, but module leaders were also asked to comment on each draft of the student schedules. The schedules, therefore, asked students about their expectations and perceptions of the module, their understanding of their tutors' expectations, and about the challenges and difficulties they experienced in taking the module. In addition, students were asked questions designed to investigate their understanding of the development of knowledge within their chosen subject area and the extent to which enquiry-based teaching has impacted on their knowledge creation and acquisition (these two areas were investigated by asking students to validate one of two statements which were provided by the module leader; see Appendix 6).

Anecdotal evidence suggests that some staff responsible for dedicated modules are sceptical as to the extent to which students are using the outcomes of enquiry modules in their work on other modules. Therefore, the interview schedules also included detailed questions which investigated the transference of learning to other modules in a student's programme of study. A specific aim of the follow-up/second interviews was to determine students' progression in enquiry abilities and any additional transference of learning.

2.3   Quantitative Data Collection (2008/2009)

This section outlines the data collecting procedures for the quantitative stage of the research. All quantitative research was undertaken during the 2008/2009 academic year. This section outlines the sample, quantitative measures, and the procedure for distributing the questionnaires. We also outline the academic grades measures used for subsequent analyses and how these have been coded ready for interpretation.

2.3.1   Sample

Six key modules identified as enquiry modules were entered in the quantitative stage of the evaluation. These were from six departments within the university and from a range of academic levels. The modules and sample size respective to each one, together with the department/faculty, academic level and type of module, semester, and number of credits per module can be seen in Table 4. Five were core modules; the sixth (Criminology) could be taken as an option or a core depending on the award being studied. Five modules were the same as those entered into the qualitative stage of the research. The exception to this was the Exploring Psychology module, offered in the Psychology department. This was entered into the research in place of the Psychology Project module[3]. Note that two separate groups were included from the Studying Society module, current students and past students (a group who had taken the module two years previously, in 2006/2007, and were now in the final year of their studies), making seven groups in total. Quantitative data was taken on two separate occasions; at the beginning of the module (Time 1) and again at the end of the module (Time 2).

In total 428 undergraduate students took part in this stage of the research. Students ranged from 18-51 years of age; mean age 22 years. Seventy percent of the sample was female and 89% had English as their first language. The sample size in any particular group varied from 30 to 139, reflecting the number of students enrolled on the module during the given year. Modules were variably delivered at different stages of a student's award, i.e. at Level 1, 2 or 3 and were delivered during different semesters.

2.3.2   Measures

Each participant completed two measures: an epistemological beliefs questionnaire and a critical thinking skills test. In addition, participants also provided information about whether they went to school in the UK and their mathematics and English GCSE grades. Module

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[3] Note that the Exploring Psychology module was actually comprised from two separate modules; Exploring Psychology 1 (run in Semester 1) and Exploring Psychology 2 (run in Semester 2). These were both 15 credit modules but for the purpose of this study were treated as a single 30 credit module. The original intention was to collect data at three separate stages for these modules; at the beginning of Semester 1, at the beginning of Semester 2, and again at the end of Semester 2. This was to determine whether there was any added value by taking Exploring Psychology 2. However, only a few students provided data at all three times of testing. Data was therefore treated as being provided at two occasions; the beginning of Semester 1 and the end of Semester 2, consistent with other 30 credit modules in the evaluation.

grades were also obtained from student records. The various measures are discussed in turn below.

Table 4 Quantitative modules by department/faculty, academic level, semester, number of credits per module, and sample size

Module	Department in which module offered	School or Faculty	Academic level and type of module (C = core, Op = option)	Semester module taken in	Credits per module	Sample size
Studying Society: Current	Sociology	Arts, Media & Design	1 (C)	1	15	39
Studying Society: Past	Sociology	Arts, Media & Design	1 (C)	1	15	31
Project Preparation & Planning	Geography	Sciences	2 (C)	2	15	30
Critical Thinking in Management	Business	Business	2 (C*)	1	15	107
Exploring Psychology	Psychology & Mental Health	Sciences	1 (C)	1 & 2	30	139
Evidence Based Practice in Nursing	Health Professions	Health	2 (C)	1 & 2	30	39
Criminology	Law	Law	2 or 3 (C or Op^)	1 & 2	30	43
					Total	428

* The Critical Thinking in Management module was an option module for the 2007/2008 academic year, but changed to a core module from 2008/2009.

^ The Criminology module can be taken as a core or option module depending on the award being studied.

Epistemological beliefs. Epistemological beliefs were measured using questions derived from Hofer (2000). Hofer's factor analysis yielded 18 items across four different dimensions of epistemological beliefs (certainty, justification: personal, source: authority, and attainment of truth). Because of time constraints, the two items most relevant to this study from each dimension were chosen for use. These items are listed in Appendix 7. Each item was rated on a 5 point scale (1 = *strongly disagree*, 5 = *strongly agree*). Higher scores indicate less sophisticated epistemological beliefs (i.e. knowledge beliefs are less tentative or more definite). Scores on all eight items were summed to create an overall epistemological beliefs score. The two items for each dimension were summed to create the dimension-specific scores. Item 4: 'There really is no way of determining whether someone has the right answers in the field', is negatively phrased. This item was therefore reverse scored prior to summing of the final scores.

Critical thinking. Critical thinking was measured using questions devised by Bowles (2009). In its original form, the Bowles' questionnaire is a 30-item multiple-choice questionnaire. Each item in the 30-item test was separated into one of three dimensions (analysis, evaluation or inference) using definitions developed by Facione (1990). Each item was rated separately by two researchers. One hundred percent inter-rater agreement was achieved.

The resulting measure consisted of eight analysis items, eight evaluation items and 14 inference items (representing 26.7%, 26.7% and 46.7% of the total 30 items). Completion of the whole test was lengthy, however, and in order to reduce completion time students were presented with a selection of nine of the original 30 items. Five sets, each consisting of nine items, were devised. There was some cross-usage across sets with some items being presented once and some items being presented twice. Final distribution of items across sets was such that totalling the number of analysis, evaluation and inference items and the time each was presented achieved the same overall ratio respectively as for the full 30-item measure. Within each set, items were presented from the lowest to the highest item number. The distribution of the items relative to their set and dimension can be seen in Appendix 8.

Critical thinking items were scored such that a '1' was given for a correct result and '0' for each incorrect result. However, because we cannot be sure that each item, and therefore each set of items, had the same difficulty attached, it was necessary to weight the items relative to their difficulty. Initially a facility score (F; the probability that a student would get the item correct) was created for each item within each set of items such that, for example:

F_{12} = % of Set 1 students who got Item 2 correct

A table was then created giving the F score for each item wherever it was presented within a particular set. By averaging across sets we were then able to produce an average F score for each item. However, examination of the table showed that for instances where an item was presented in more than one set, whenever the item was presented as the *first* item the probability of getting that item correct was much lower than if the item was presented at a later stage. This occurred for three items (Items 6, 7, and 15). This could be an instance of sequencing effects occurring as a consequence of 'transfer by analogy' (Gentner, 1983; Gick and Holyoak, 1980). Basically this suggests that performance for a specific problem is likely to improve if one solves structurally similar problems in succession. Therefore if an item is placed first in a sequence of similar items it is less likely to be solved than if it is placed later in the sequence.

In order to the check the perceived difficulty of the items, those that were presented in more than one set (e.g. Items 6, 8, 9, 10 in Sets 1 and 2) were summed within each set and divided by their number (i.e. by four for Sets 1 and 2). This resulted in a ratio score for each set (e.g. the ratio of the probability of getting that set of items correct for Set 1 as opposed to Set 2 was $P_1:P_2$ = 49.125:61.567). This was done for each pair of sets that had overlapping items. For consistency in the difficulty of the scores within sets we would expect the ratio for $P_2:P_3$ to follow through from $P_1:P_2$ and so forth, with $P_1:P_5$ being a logical extension of the overall $P_1:P_4$ ratio. For our first set of calculations this was not the case; whilst the overall $P_1:P_4$ ratio was $P_1>P_4$, the $P_1:P_5$ ratio was $P_1<P_5$, which was not consistent. This indicted a discrepancy in the difficulty of the scores within one or more of the sets. Therefore, we repeated these calculations excluding the three items judged unreliable due to 'sequencing effects' (see above) from the calculations (i.e. Items 6, 7 and 15). This resulted in a logical overall $P_1:P_5$ ratio. We thus concluded that these three items, when presented first in a set, were biasing results such that they were more difficult for students to complete.

Accordingly, the average F scores were recalculated excluding these items where they appeared first in a set.

The average F score was then used to determine a standardised average F score such that:

standardised average F = average F – mean average F / standard deviation average F

This standardised average F score was then multiplied by $-\frac{1}{3}$ in order to achieve a value between -1 and 1 with which to standardise the raw item '1' or '0' scores. Both correct and incorrect items were standardised by adding the standardised average F score to the raw score. A total critical thinking score for subsequent analyses was calculated by adding together the nine standardised item scores. Critical thinking scores for each dimension (analysis, evaluation, inference) were calculated by adding together the standardised item scores for that dimension. Because the numbers of analysis, evaluation and inference items are different within each set of items it was necessary to create a ratio score for each dimension. This was done by dividing the total of standardised item scores for each dimension by the total number of items within that dimension. This created a ratio score for each student for each dimension that could be used for subsequent analyses.

GCSE grades/going to school in the UK. Students provided their mathematics and English GCSE grades. Mathematics and English GCSE grades were aggregated to give a combined score out of 9 given that A*=4, A=3, B=2, C=1, below C=0. For subsequent analyses high GCSE = the sum of mathematics and English GCSE = 6, 7 or 8; medium GCSE = the sum of mathematics and English GCSE = 4, 5 or 6; low GCSE = the sum of mathematics and English GCSE = 0, 1 or 2. For those students that did not go to school in the UK and therefore did not have the option of taking GCSE qualifications a dummy variable was created where 1 = went to school outside the UK/did not have the option of taking a GCSE, otherwise = 0.

Module grades. Module grades were obtained from student records. Students indicated whether they were happy for us to obtain these grades on the questionnaire pack at each stage of testing. In cases where students gave their permission, end-of-module grades were obtained for each of the six modules. In subsequent reporting of analyses these are referred to as the 'study module' score[4]. Module grades were also obtained for all other modules that students had completed during the 2008/2009 academic year. For subsequent analyses an average of these grades was calculated. Grades were only used for the average calculations in cases where other modules had been taken consecutively with or after the study module. Therefore, where the study module was run in Semester 1 or across Semester 1 and 2 an average of all other modules was taken. Where the study module was run in Semester 2 an average of only the other Semester 2 modules was taken. This score is therefore referred to as the 'consecutive modules' score in subsequent analyses.

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[4] For Exploring Psychology the final grade was calculated taking an average of Exploring Psychology 1 and Exploring Psychology 2 grades.

2.3.3 Procedure

Questionnaires were delivered by a member of the research team during the first three weeks of the module and again during the final two weeks of the module. Students were advised that the questionnaire was part of an investigation determining the impact of enquiry-based learning on students' learning. All students were given the same epistemological beliefs questionnaire to complete but were given one of the five item sets of the critical thinking test. The sets were delivered such that the proportion of each was equal within each module.

2.4 Method of Analysis

The results of the analyses are given in the following sections. First we present a summary of the themes and issues arising from the review of module specifications conducted during the 2006/2007 phase of the research. Secondly, we present a summary of the modules leaders' interview data by module. Thirdly, we present an analysis of student interview responses by module. These latter two sections are structured to reflect the questions as they are presented on the interview schedules. We next present an analysis of the quantitative data. This section comprises a number of subsections that it turn discuss the differences between different subject modules in critical thinking abilities and epistemological beliefs; the relationship between critical thinking/epistemology; changes in students' critical thinking abilities and epistemological beliefs over the period of the study, (i.e. from the beginning to the end of the modules in question); and the relationship between academic performance and critical thinking/epistemological beliefs.

3 Review of Module Descriptors – Themes and Issues

Following the review of module specifications a number of themes and issues have been identified:

1. Some of the language in the learning outcomes of module descriptors implies shared purposes by staff in different parts of the University to the extent that the development of capability for enquiry is expressed in general terms. For example, one module descriptor in Business has the outcome: 'Understand the process of critical reasoning and employ that understanding in support of the student's personal development as a learner'. A module descriptor in Arts, Humanities and Media has an outcome: 'An ability to work effectively as a team member in identifying a research problem, developing a strategy to research, and study it, undertaking collaborative research'. However,

2. There is substantial variation in how members of staff are interpreting the University learning outcome statements. For example, one module has a learning outcome of 'Be able to *research* the demand for a good or service', which is matched to the learning outcome *'Application'*, whilst another module allocates 'Apply critical thinking skills to a well defined problem and demonstrate emerging recognition of the complexity of associated issues' to *'Problem Solving'*, and another allocates 'Analyse the potential for community development in a range of practices and locations' to *'Enquiry'*. This variation in the use of language might indicate that there is not much common ground in the meaning given by staff to some key terms that describe what they are aiming to achieve through their teaching. Alternatively, it could be that staff do not regard module descriptors as particularly important on the basis that they communicate the purposes of their teaching to students in other ways.

3. There are difficulties in defining what should be regarded as an enquiry module. Module descriptors that incorporate some element of enquiry skills are written with a range of purposes in mind and fit into degree programmes in different ways. Any attempt at classification pigeonholes some modules in ways that distort their stated intentions. There are some modules that overtly claim to develop:

   (i)   Students' generic enquiry capabilities (e.g. 'The ability to reflect critically on your own skills and weaknesses');

   (ii)   Students' subject-specific enquiry capabilities (e.g. 'Be able to use cognitive skills to apply a given range of techniques and concepts to more effectively analyse, evaluate, retrieve and organise information relating to issues in the management of organisations');

   (iii) Students' general processing skills (e.g. 'Demonstrate competency in writing IT presentation skills');

   (iv)   Students' subject-specific skills (e.g. 'Estimate economic relationships using ordinary least squares').

If enquiry capability is assumed to be generic then only (i) and (iii) fall into the category of developing enquiry skills. However, if enquiry capabilities are seen at least in part as context bound then (ii) and (iv) come into play. Modules that are readily identified as contributing to the development of students' enquiry capabilities tend to have learning outcomes that follow the open format of (i) and (iii), although this does not demonstrate that these modules are indeed similar in their demands on students. Moreover,

4. Current analysis of data does not provide evidence one way or another as to whether there are 'spill-over effects' from dedicated modules. In conversations with some staff responsible for dedicated modules some scepticism has been expressed as to the extent to which students are using the outcomes of dedicated enquiry modules in their work on other modules in their programme of study. In addition,

5. Descriptions of learning outcomes in generic terms tend to give little indication of the demand that is being made of students. For example, 'Communicate information and argument, in written form, effectively', or even better 'Effectively communication [*sic*] information and ideas in verbal and non-verbal forms'. If the ability to communicate is as generic as these statements imply then any academic across the university ought to be able to have a reasonable guess as to which level these statements refer to. This principle applies equally to other aspects of general capability. For example, it is not obvious which academic level to place 'Demonstrate the ability to engage in arguments showing depth and breadth of reading'. It may well be that lecturers are communicating a sense of progression to students in other ways, however.

4   Interview Analysis – Module Leaders

4.1   Studying Society Module – Sociology

The Studying Society module is a 15 credit core Level 1/Semester 1 module, run in the Sociology Department for single honours students, which provides an introduction to a range of independent learning skills required to pursue a degree in Sociology; Crime, Deviance and Society (CDS); and the Social Sciences generally. For joint honours students the module is recommended but not core. The module is workshop-based. Topics covered include using computers as a research and learning tool, using the library, undertaking primary and secondary research, writing skills, including bibliographic skills, undertaking presentations, interpreting data, maintaining a personal development portfolio and writing a CV. The relatively high levels of 'mature' students taking this module are reflected in the proportions of students interviewed.

4.1.1   Module leader's conceptualisation of enquiry learning

The module leader for Studying Society used such terms as 'skills and competencies' to refer to the task of developing students' enquiry abilities. They conceptualised enquiry learning as having a number of various aspects; basic research skills, making efficient use of the library, making efficient use of web resources. Very specifically:

> You have also got the question of interpretation, how to interpret what people read, for example, how to make notes on it, how to summarise what is in the literature. Equally important is the ability to read and make sense of statistical data, figures and simple tables that one finds in many sociological text books.

He was of the opinion that a capacity for enquiry learning and critical reasoning is very important for a degree within Sociology and its related areas. In his view it is one of the aims of higher education – that higher education should be turning out students who are able to think independently and understand the different dimensions of a problem, as well as identify flaws in reasoning and be able to synthesise knowledge from different fields. Such a person will have the ability to bring knowledge from different areas and different fields together and: 'spot common trends and be able to use the different knowledge to construct new knowledge'. For the module leader, enquiry and critical reasoning is a characteristic of all knowledge and subject areas, not just related to Sociology or Crime.

The module leader hoped that the outcomes from their teaching on the module positively affects the ways in which students approach their work on other modules but they also felt that the modular degree system 'encourages students to think within separate compartments' and 'does not encourage cross-thinking between modules'. Despite constantly reiterating to students that what they learn in the Studying Society module can be used in all their studies, students are 'simply not applying it to their other stuff'. In his

view only about 10-20% of the students have the capacity to transfer knowledge learnt from one module to another:

> Well the good students, the people who get the good 2:1's, particularly the people who get the 1[sts], will do that, but the people who get the 3[rds] and the low 2:2's are not doing that.

The module leader felt that the limited transference of knowledge could be partly overcome by more collaboration between members of staff in terms of knowledge of the content of other modules and dissemination of this knowledge to students. However, they also acknowledged that staff workload does not make this particularly easy.

4.1.2   Aims and assessments of the Studying Society module

The module leader for Studying Society felt that their teaching does capture the aims and learning outcomes as given in the module descriptor. The module has been running for about 10 years and the aims and content of the module have developed over that time to reflect student needs. He reported that the good students share the objectives of the module but that there is resistance from some students who do not see its relevance, who seem to 'think that they know it all'.

The teaching takes place in two-hour workshops – students are given a talk for around 20 minutes, then they work on set tasks from the handbook. The most important aspects of the teaching that affect whether students transfer knowledge to other subjects were seen by the module leader to be research skills, using the library, using the internet, and such like. For them an indication of what students are making of the module is whether or not they turn up. The students that turn up each week are usually those that get the best marks and usually go on to get the good degree. Although it does not necessarily mean that the students who do not turn up do not perceive the module as important – they sometimes have other issues, such as childcare.

The assessment for the module is portfolio based. When asked what is the critical difference between a student who is just failing and one who is just passing the module leader replied that it would be very difficult for students not to get at least a 2:1. This is because of the way the module is structured:

> The mark generally tends to be based on how bulky the portfolio is. Perhaps that shouldn't be the case but if it is a bulky one then they have attempted all the assessments and by virtue of having attempted them they are virtually assured a 2:1. That, I suspect, is simply a facet of the module. Obviously what differentiates a 1st from a 2:1 would be the quality of the work. Work which is well done, and into which the student has put a lot of effort and a lot of thought, will get, generally, a good 2:1 or a 1st.

Students do not have to attempt every unit to pass the assessment. To fail a student would need to attempt only three or four of the units out of a possible eight or nine. It is unusual for students to attempt fewer than five units. Students tend to fall down on getting the bibliography correct. The module leader felt that students do not take this aspect of their

studies too seriously and do not bother actually reading the notes on how to reference the different types of sources.

Students vary considerably in terms of their prior knowledge of enquiry/critical reasoning skills when they begin the module. Challenges for the module leader include trying to teach students 'to stand on their own two feet and actually try to get them to do the work for themselves', and getting them to use the library properly and the internet sensibly. Challenges which the students face are learning how to construct/write an essay and how to use the English language properly. The Studying Society module leader was of the opinion that the assessment system within the University is detrimental for students' skills development in that there is not enough time for them to practice effective writing skills. He also suggested that for students to address any difficulties or challenges that they experience they must be prepared to ask for help. However, in his view, many students fail to realise, or refuse to accept, that they have a problem.

4.2   Project Preparation and Planning Module – Geography

The Project Preparation and Planning Module (or Project Planning for short) is a 15 credit core Level 2/Semester 2 module, run in Semester 2 in the Geography Department, which takes students through the various stages of project design in preparation for the triple module project or work-place project to be taken in Level 3. The module is part lecture-based, part supervisor led. Topics include literature searching, relevance trees, bibliographical sources, research question formulation and research approaches, and key transferable skills such as oral communication and personal development planning. The end result is that a student will have chosen a research topic for their Level 3 project and will be well underway with their literature search in that topic.

4.2.1   Module leader's conceptualisation of enquiry learning

In referring to the task of developing students' enquiry abilities the Project Preparation and Planning module leader favoured the term 'enquiry':

> We probably favour enquiry, methods of enquiry, enquiry-based learning and then we qualify it by looking at, or calling it, self-independent research. We very much relate it to research rather than referring to it as critical thinking or anything like that. It is more about research and we just assume that there will be some sort of critical, self-reflective, evaluation of how the research has gone, led by how the enquiries have gone.

Students are expected to develop a range of enquiry skills across their degree programme. The Project Planning module is a culmination of what students have done at Level 1 and Level 2 in terms of literature based enquiry. The first part of the module is, once they have identified a topic with their supervisor, to write an extended essay, which is testing, or reinforcing their current knowledge, and further developing their ability to do a literature review based on enquiry. The second part of the module asks students to look at other forms of enquiry, i.e. research methodologies/techniques, which methodological approach, devising research questions, and so on.

The module leader felt that taking the Project Planning module is essential for a degree programme within Geography. Geography curricular are designed so that there is a strong spine of core modules at each level which students all relate back to, irrespective of what option modules students take (the two other core modules on the spine are Advanced Geographical Skills and Field Class). This spine of core modules helps to develop students' enquiry-based learning in terms of providing them with the skills to go out and find information for themselves. The module leader reported that all Geography staff viewed this as 'the way you do Geography'. The Geography award is structured so that knowledge 'cascades down' to other modules. The whole idea of being a geographer is deep-seated and embedded in the whole Geography programme. The module leader also reported that for students there is an expectation that Geography is about 'working things out for themselves', not just in the classroom, but out in the field. He suggested that it is this willingness 'to actually go out and do it' that makes the nature of enquiry in Geography distinct from enquiry as experienced in other subjects.

The viewpoint of the Project Planning module leader was that enquiry learning is necessary for all subject areas; it stimulates the students, provides them with opportunities to apply what they have learnt and makes them more confident. He reported that they see the spin-offs for students in the third year – their essays demonstrate a more extensive range of reading and cross-critical thinking and they understand more the notion of independent learning. For him, enquiry modules raise the students' game for getting to their dissertation from a literature/library/enquiry point of view. The better students will demonstrate clearly the critical thinking that they have gone through, they will have picked up debates and different viewpoints about the same topic and discussed them. Furthermore, the module leader stated:

> I would be surprised, and even disappointed, if other subjects weren't developing students' abilities to enquire for themselves. I think this is what we should be doing.

The module is different from anything the students have been presented with before on their degree; the emphasis is very much about the students taking responsibility. The module leader suggested that the most challenging part of the module is getting students to think creatively and choose their own topics for the Level 3 dissertation, rather than expecting ideas to be 'spoon-fed' by their tutors:

> The biggest challenge for the students is the realisation that this is their project, their plan, and the tutor is just going to be a sounding board to offer guidance but they will not give you a project.

4.2.2 Aims and assessments of the Project Preparation and Planning module

Whilst the Project Planning module leader felt that their teaching does capture the written aims of the module on the module descriptor he also expressed disappointment that 'enquiry' is listed only against Learning Outcome 2 (the ability to conduct an effective literature survey). He felt that enquiry should be listed by more of the outcomes (there are seven in total). Also, he suggested that in terms of devising research questions, methodology and an action plan, the enquiry process is something that they should cross-

reference on the descriptor as he is confident that tutors on the module achieve this in their teaching. The aims are about ensuring that students develop as independent learners, have an ability to be creative and self-enquiring, and ask questions about the environment and the topic in which they are interested. Specifically, in terms of self-reflection it is hoped to get students to ask questions of themselves – How did I do? How am I managing this? How is this working?

The module has been running for at least ten years and, in response to student needs, has been through a number of reviews since its conception. All Geography staff bore into its development and it is seen as a key module within the curriculum. A specific question is asked at each review:

> ...every time we have always asked 'Is this really now working?' It has always been one of the first modules that we have put into the core curriculum so we are reaffirming that this is the case.

The module leader felt that students do not always realise that the module is so important, although he did acknowledge that 'we don't tell them enough why it is so key'; the importance of the module is stressed in the opening sessions but could probably be reiterated more regularly.

The module structure starts with five weeks of whole-group lecture sessions. The remainder of the module consists of group or one-to-one supervisory sessions. In terms of the formal assessments, students are required to complete an extended essay, a project proforma and an oral presentation. Enquiry is assessed mainly through the extended essay and is cross-referenced as such on the module descriptor. Enquiry is also assessed to a certain extent through the proforma as students have to come up with a research proposal and justify it. This is not cross-referenced on the module descriptor. However, whether the proposal is fit for the purpose, how thorough it is, and how it demonstrates a students ability to apply their ideas is assessed: 'ultimately what we don't want to do is pass something which actually is not going to deliver the enquiry that they [students] will need for their project'.

The minimum threshold for passing the module is whether or not a student could produce a dissertation using what they are proposing such that they could achieve a third class degree or a 2:1, i.e. 'if we are confident that, based upon what they have described to us, they can find data/create data that will lead to a reasonable dissertation'. The higher grade points are given dependent on how well a student has engaged with the topic, and articulated and demonstrated a full understanding of what is going on.

The module leader reported that the typical level of prior knowledge/abilities in terms of enquiry is quite high, especially for those students that have come straight out of school or college – Geography in school comprises an element of project work and enquiry. Although there is some variation across students he suggested that not only do students expect there to be project and field work, for most it is actually the reason they take a Geography award.

4.3   Critical Thinking in Management Module – Business

The Critical Thinking module is a 15 credit Level 2/Semester 1 option module run in Semester 1 in the Business School which provides a formal introduction to critical thinking processes and skills, and encourages students to develop and exercise higher order thinking abilities and apply them within the context of topics critical to the management of organisations. The module is lecture-based. When the interviews were conducted in 2007/2008 the module was an option module. However, from the 2008/2009 academic year it was changed to a core module for students on all Business awards.

4.3.1   Module leader's conceptualisation of enquiry learning

The module leader for Critical Thinking in Management does not think of the task of developing students enquiry abilities in terms of 'enquiry'. He reported that it is more the ability to construct a sound argument and criticise an argument that is key, with the enquiry aspects being on the side. From his perspective, the enquiry aspect is more a case of finding evidence or reasons to support conclusions in assignments and exam answers, and how to go about doing that, and how to assess the quality of such evidence. For him enquiry is:

> ...a little subset of critical thinking. A certain argument is a valid conclusion supported by sound evidence. It's a subset of that really. It isn't the objective. The objective is understanding and recognising what sound argument is, and critically assessing evidence and so on.

Students are required to develop levels of critical reasoning such that they have to arrive at an effective answer/conclusion to the question or task that they have been set, supported by evidence.

The module leader felt that a capacity for critical reasoning is essential for every programme of study; 'it is not subject-specific'. For him, there is nothing distinctive about critical thinking within a Business award – it is a generic thinking skill that can be applied in any subject area. The only distinctive thing about its application in Business is that the examples would primarily be about Business. While the module leader constantly reiterates to students that what they are taught in the Critical Thinking module is transferrable to their work in other modules, he was sceptical as to whether students are actually applying what they learn to other areas. He stated:

> My guess is the success of doing that [transferring learning] is limited because they [students] think 'This is what [module tutor] talks about on Wednesday morning' and 'This is what you have got to do to get a good mark in [module tutor]'s module'.

He felt that students see separate modules as 'a set of compartmentalised things'. Furthermore, he suggested that a lot of students understand that they are supposed to do something, but they do not know what to do or understand why they do it badly. They do not grasp the concept of why they need certain things – reference lists were given as a specific example of what students do badly. The module leader felt that the key thing in terms of transference of learning is that the assessment process in general is consistent across modules. The following quote illustrates his point:

So, if I'm saying 'You need to do this', 'You need to have decent academic sources in order to get a good grade', and then everybody else just says 'It doesn't matter what you do', in terms of what feedback you give the students and so on, then I'm just wasting my time because they [students] will think it just happens in my module.

4.3.2   Aims and assessments of the Critical Thinking in Management module

The Critical Thinking module leader felt that the aims and objectives on the module descriptor are quite accurate and explicit and capture very well what he is trying to achieve in his teaching. He did, however, feel that the students do not always understand these objectives with some students not being interested in them at all, not buying the recommended text or reading the literature, and only putting together their assignment at the last minute.

In his teaching, the module leader uses techniques designed to make students attend more to what is being presented in lectures (such as not putting the title on PowerPoint presentations to encourage students to listen to what is being said). He suggested, however, that these kinds of techniques do not work if they are used all the time; students 'just ignore it, they don't do it'.

The module assessment is comprised of a group presentation and an essay. Critical for whether a student achieves a pass or fail are the core academic skills, whether a student can produce a comprehensive reference list or construct a sound argument, and such like. There is, however, a lot of variation in student's prior abilities in terms of critical thinking/core academic skills – there are a small minority that have quite high levels of prior ability (mainly students from Denmark or Germany) with the remainder having much lower levels.

4.4   Psychology Project Module – Psychology

The Psychology Project is a 30 credit Level 3 module run in the Psychology Department across Semesters 1 and 2. The module is not core but is essential for those students wishing to receive BPS (British Psychological Society) accreditation for their degree. Therefore, virtually all single and joint honours students choose to take it. The module provides students with the opportunity to conduct, under supervision, independent psychological research in one of a broad range of areas. It is supervisor led, rather than lecture-based, and is an opportunity for students to develop and refine their skills in literature searching, research design and planning, data collection and analysis, and research-reporting. The relatively high proportion of 'mature' students taking the module is reflected in the numbers of mature students interviewed.

4.4.1   Module leader's conceptualisation of enquiry learning

The module leader for the Psychology Project preferred the term 'enquiry' for referring to the task of developing students' enquiry abilities rather than the term critical thinking/reasoning or argument. This is because the term 'enquiry' actually highlights that students are learning to enquire about things and seek information, rather than just

engaging critically. Enquiry learning for the Psychology Project is conceptualised such that the module takes students from an idea all the way through to a project report. Students come up with a project idea, prepare a work plan and then turn that plan into actions, including undertaking a literature review, devising research questions, completing ethics forms, collecting data and writing the report. It is the final element of all Psychology awards and builds on the knowledge and abilities that students have learnt over previous years. Enquiry-based learning is introduced in other modules in Psychology but the Psychology Project is by far the most applied.

The module leader felt that a capacity for enquiry learning applies to some modules more than others within Psychology; there are modules that are assessed more on knowledge and modules that are looking more at researching a particular field. The Psychology Project module does not lay any great emphasis on transferring the knowledge learnt whilst undertaking the project to other modules on a student's award. It is expected that by Level 3 it is more likely that learning from other modules will impact on their Level 3 project, rather than the other way round. The module leader suggested that any new skills learned 'would be transferable skills for employment rather than impacting on other modules'. She felt that the Psychology Project may, however, impact on other modules in another way; because the module is a major part of the Level 3 curriculum if a student is not organised then the time available to work on other modules can be negatively affected.

4.4.2   Aims and assessments of the Psychology Project module

The Psychology Project module leader felt that the module captures very well the aims and objectives of the module descriptor. In her opinion the module is really important for a degree in Psychology because it prepares students for the workplace in ways that other, more knowledge-based modules, do not. The Psychology Project is also the module that helps students towards future career development as a psychologist or postgraduate training. It is also a requirement from the BPS that all students undertake a Psychology Project if they want Graduate Based Registration (GBR). However, it is important that students do relatively well in their project in order to get GBR – students now need a second class degree minimum.

The module leader felt that students understand what the objectives of the module are in principle but they sometimes find it a little difficult putting it into practice, especially in terms of planning their time. Tutors on the module emphasise how important it is to plan but the module leader felt that they need to do this even more in the future, although there can be issues in relation to the independent learning nature of the module:

> One of the aims is also that they [students] learn to work independently, so it is a balance to be had between really chasing them so that they manage it in time, and allowing them to make their own mistakes and learn from them...   ...Some of their learning really is about finding out that it is not actually that easy to carry it all the way through.

Another problem in trying to achieve the aims of the module is that it is time-consuming for members of staff:

> The marking of it and the second marking of it – they are all second marked – takes a lot of time…   …It is a very time consuming module to run for tutors because there is a constant stream of students asking questions and tutors have to keep on top of it.

At the time of the interview there were no plans to make any further developments to the module – at that time the module leader was of the opinion that the module worked reasonably well. However, she had only just taken over the role and was intending to run the module for a year before making any definitive decisions on these issues. By that time she felt she would also be able to infer a greater sense of what students make of the module.

The assessment for the module takes the form of a research project, a high component of which is assessed in term of enquiry (four of the nine learning outcomes on the module descriptor are enquiry-based). The difference between a fail and a pass is that a student who fails does not connect all the bits of the project together and so does not see the project as a whole, rather than a series of stages. Most specifically a student who fails might 'not really think about the research question too much, may collect random data and then write that up in a muddled discussion'. In contrast, a student who passes sees the project as a work in progress that 'all ties in together and works towards the same goal'. In the module leaders opinion, the critical difference between a student who gets a 2:1/2:2 or a first class degree is the level of critical analysis – the student has the ability to engage with all aspects of the project, the literature and data they have collected are related to the research question, and the student is able to look at that information critically.

The prior ability of students in terms of enquiry/critical thinking skills is variable, in the opinion of the module leader. There are a number of students who struggle with research methods and devising research questions, despite there being four core research methods modules (qualitative and quantitative) that must be completed prior to taking the Psychology Project. 'Stats clinics' are run for students who experience problems with research methods. Students are also encouraged to see their supervisor on a regular basis, especially when devising the research questions and completing the ethics forms, which both need to be agreed with the tutor. Contact time with their supervisor tends to vary from student to student. Some students are keen to maintain regular contact whilst others only request a meeting if they have a problem. The module leader herself will email those students that she does not hear from regularly to ask them if everything is ok. Other supervisors may work in different ways.

4.5   Evidence Based Practice in Nursing Module – Health Professions

The Evidence Based Practice in Nursing (EBP) module is a 30 credit core Level 2 module, run across Semesters 1 and 2 in Health Professions for single and joint honours students taking various nursing degrees and diplomas. The module aims to develop understanding of the evidence and values basis of nursing, the role of nursing research and its relationship to evidence, and the influence of evidence and values on decisions made collaboratively by health care professionals and service users within the therapeutic relationship. The module is lecture and workshop-based. Topics covered include evidence and values based care and practice, ethical issues, defining research and its relationship to evidence based practice,

critical appraisal of evidence for practice, and methods of nursing enquiry and differing research methodologies. The module provides a practical grounding for nursing placements; all Health modules are structured such that students are in the University for six weeks, go away on placement for six weeks, and then are back in the University for two weeks.

4.5.1   Module leader's conceptualisation of enquiry learning

In referring to the task of developing students' enquiry abilities the module leader for EBP does not use terms such as 'critical thinking', 'critical reasoning', 'argument', 'enquiry', etc. but initially preferred to use plainer language designed to get students to question practice:

> The terminology that I use is more about using plain language which is talking to them about questioning rather than using terms that we would use like [in] module descriptors and enquiry. They [students] don't necessarily get to grips with the concept of enquiry for a little while but they certainly can understand the idea that you question something and a more pedagogical term such as enquiry or interrogation of the literature is something that you avoid until later on.

He was of the opinion that a capacity for enquiry/critical reasoning is essential for an award in Health; students/healthcare professionals need to question and reflect on their practice, rather than doing it because their colleagues tell them that is the way that they have always done it. He does not see anything particularly distinctive about enquiry within Health but sees the principles as being the same across all awards.

The module leader hopes that the outcomes from their teaching on the EBP module will be transferred across to other modules. He suggested that the key thing for transference of learning is getting students to question what they read. He did, however, suggest that the development of the modular system makes it difficult for students to find the links between modules. Within the Health Professions they design courses with progression and a relationship between different knowledge bases in mind. However, there are a 'fair number' of students who do not make the connection until right at the end:

> You can hear it when you are talking to students. Some will say 'Oh I recognise now that what I did in the second year has a link with this'. But it is a fairly late awakening. Others will actually see the relationship and will make the connections and interrogate the literature that they look at in other modules on the basis of the skill we have given them, hopefully, in ours.

The module leader felt it is more likely that students will transfer their knowledge if tutors make students aware of the relationship between modules and, in their introduction to a new module, say how it builds upon what students have done before. In their view, what works against students' transference of knowledge is the nature of the relationship between theory and practice; students tend to think more about 'how to' rather than 'why?':

> 'How do I take blood pressure?' 'How do I give an injection?' As opposed to: 'Why are we doing this particular treatment pattern for this particular group of patients?'

4.5.2   Aims and assessments of the Evidence Based Practice in Nursing module

For the module leader one of the aims of the EBP module is to try and make research come alive, to try and get students to connect the relationship between doing research and improving nursing care and question what they see as normal practice. He hoped that students develop enquiry/questioning such that they are 'thinking in terms of a debate between different pieces of work'. Ultimately, the aim is for students to develop critical thinking skills whereby they do not see a piece of work as being isolated from the rest of the knowledge base. He felt that the written aims on the module descriptor do capture what he is trying to do in his teaching; the aim is to get students to examine the evidence base to say what will improve the quality of the care of patients, and to think in terms of the values that nurses, as a profession, are supposed to hold.

The teaching takes place in eight six-hour workshops spread out evenly across the eight weeks that students are in the University. Workshops are mainly group-based and arranged around discussion and critique of a series of qualitative/quantitative articles:

> We break them up into groups and we have them discussing those articles and raising questions from them. We set them a baseline which is 'You need to think about three different aspects of it'. It is essentially a why, how and what. That is the easiest way to get them thinking. Why are the researchers looking at that? Do they explain why they are looking at it? What was the methodology that they used to do it? What did they find out? It is fairly straightforward.

The main concern is to get students to develop a link between critiquing current practice and nursing values; the two significant elements of the EBP assessment. The quality of work produced tends to be very good. Students 'do make connections; they do set up debates'. The critical different between a student who is just passing and one who is just failing depends on two things; one tends to be the breadth of reading and this seems to be more evident in some of the more mature students. The other is between those that that do/do not make the links between what they are doing in the classroom and what they are doing in placement; 'the connection between reflecting on their reading and reflecting on their doing'.

Students are given a critical appraisal tool to help them to think through the articles in more depth. These are sets of questions that enable the reader to critique research papers more systematically. These are used consistently in Health disciplines; one of the key ones is the Critical Appraisal Skills Programme (CASP)[5], ten questions developed by one of the Primary Care Organisations, i.e.:

> It will be things like: Was the methodology appropriate? Was the research design appropriate? How was the data analysed? Were the findings written up in a way that was understandable? It is very systematic and there are ten key elements.

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[5] Critical Appraisal Skills Programme (CASP). Critical appraisal tool developed by the National Health Service Public Health Resource Unit, Oxford. Accessed via http://www.phru.nhs.uk/Pages/PHD/CASP.htm

Students use these and other similar tools (e.g. those devised by the University of Salford[6] and those listed by the University of Sheffield[7]) to help guide their studies. Enquiry learning is specifically assessed in the assignments and key is how students have made use of these critical appraisal tools, e.g. How have they brought in the wider research methods literature? Are they asking the right kinds of questions? Essentially it is 'about how they [students] have interrogated the article'. It is the level of expansion and the flexibility of approach to the material and the way that students make wider use of the literature to support their argument. For example:

> If a question from the critical appraisal tool says 'Is the use of qualitative methodology appropriate?' and they say 'Yes, I think it is appropriate'. Well obviously that is weak. It is when they say 'Well within nursing research the phenomenological approaches are common...'....

The module leader reported that the prior knowledge in terms of students' enquiry and critical thinking is relatively high at the start of the module. He felt that this may be because students already have a vocation or job concept, and therefore have a purpose for what they are doing, and will already have read significantly around topics related to nursing. This makes it easier for them to integrate practice and theory.

4.6   Criminology Module – Law

The Criminology module is a 30 credit module, run in the Law School. The module runs across both Semesters 1 and 2 for both Level 2 and Level 3 students. It is cross-disciplinary, i.e. it runs for students taking single or joint honours Law, Forensics, Sociology or Psychology awards. The module runs as either a core or an option module depending on the award being taken. The module focuses on presenting issues relating to crime and criminals across a varied number of disciplines: Law, Psychology, Philosophy, Sociology, and Social Policy. A combination of lectures, tutorials, student centred research and collaborative learning is used to tackle issues involved in the study of modern criminology. Sessions encourage the development of problem-solving skills, critical evaluation, effective research of current trends in Criminology, and the use of traditional (library-based) and non-traditional (internet-based) research techniques.

4.6.1   Module leader's conceptualisation of enquiry learning

The module leader for Criminology used such terms as 'critical thinking' and 'analysis' to refer to the task of developing students' enquiry abilities. Students are being asked to analyse critically what is going on in the world and to set that in the context of Criminology:

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[6] University of Salford Critical Appraisal Tool. Health Care Practice Research and Development Unit, University of Salford. Accessed via http://www.fhsc.salford.ac.uk/hcprdu/critical-appraisal.htm
[7] Comprehensive list of links to critical appraisal tools compiled by the School of Health and Related Research, University of Sheffield. Accessed via http://www.unisa.edu.au/cahe/CAHECATS/

> I hope that they will get link into things like broadsheets, reading the newspapers, being able to analyse what is happening. ...There are an awful lot of social comments about how people deal with other people, what crimes people commit and all that sort of thing. I expect them to be getting a broad grip of that by doing some critical thinking and reasoning around that.

The module leader felt that a capacity for critical thinking is essential for a degree in Law, Forensics, or Psychology. For them, it is a core thinking skill which is essential for all subjects. It is intended that learning from the Criminology module will impact on students' work on other modules. However, the module leader suggested that it would be difficult for colleagues to facilitate this as they would need to know everything that is taught in other modules on the three core disciplines feeding into the Criminology module. Accordingly, the Criminology module is somewhat 'stand-alone' in that it is not formally linked to other modules on students' awards. The module leader hoped that students would be drawing on information from all their modules to put into their assessments and tries to facilitate this by encouraging broad reading. They reported, however, that evidence of cross-discipline thinking and transference of learning across modules is very limited.

4.6.2   Aims and assessments of the Criminology module

The aim of the Criminology module (which can be seen to a greater extent in the module handbook, rather than on the module descriptor) is to take the study of crime beyond 'thinking' to a more scientific level:

> Criminology is a field of study which goes beyond just thinking about crime so it isn't what they just see in the papers it is actually what is behind that. It is being called 'the scientific study of crime' but even this definition does not fully encapsulate the full meaning of the subject which crosses the boundaries of many disciplines. We are saying to students 'Look crime happens, we know we live in a society which has crime but what we actually want to do is to pull that away and ask: Why crime is happening? What are the triggers that people commit crime, waves of crime or types of crime?' There is an awful lot of critical thought going on [i.e. for Criminology students], I hope.

The module leader felt that their teaching does capture the learning aims outlined in the module descriptor and the module handbook. The message is reiterated all through the year in both semesters. They did feel that there are differences in the extent to which students understand the concepts being taught, however. In the main students on Psychology and Sociology awards pick up critical thinking and analysis skills quicker than those on Law or Forensics awards. Law awards are very much focused on teaching straight Law rather than research skills, and Forensics students struggle because they are more scientific. Psychology and Sociology awards, on the other hand, already include some element of critical thinking and research skills teaching.

Teaching on the module is structured over two semesters with twelve topics covered every semester. For each topic there is a two-hour teaching slot which is aligned with a tutorial. The topics are also aligned with the core recommended book for the module. However, limited numbers of students buy/read this book, and the module leader felt that this failure to broadly read around topics is detrimental to achieving the objectives/aims of the module. They felt that getting students to read is the main obstacle in terms of achieving their aims.

Enquiry learning is formally assessed via two assessments; an essay in Semester 1 and an exam in Semester 2. Differences between a 3rd Class and a 1st Class degree relate to the level of enquiry with the assessments:

> For me the difference between a 3rd and a 1st is that level of enquiry, level of engagement, that analysis really, that setting the stall out the first week of teaching. If they can analyse and cross reference, and they are quoting theory back to me, and they are applying theory that is a 1st [Class degree].

The marks have been falling in recent years. The module leader related this to students putting in more of their own opinion:

> I have been teaching this now for about six years and I'm finding the marks are going down. That has correlated with students putting more of their own opinion in. I don't want their opinion on crime or what they think about an element in society. What I want them to do is to look at the problem and to analyse that problem and apply theory to it, the theories that I have given them. ...Their opinion is valued in tutorials if it is backed up with some sort of theory, relevant theory.

Level 2 and level 3 students are set the same essay assignment but Level 3 students are required to submit a higher word count. This reflects the supposed higher level of critical thinking skills that Level 3 students are expected to have at the start of the module. Third year students are expected to put more critique and theory into their assignments although this requirement has not been formalised. The essay is a hypothetical assessment that requires the design of a research project. Students are increasingly finding trouble with this despite the fact they are given twelve systematic bullet points to guide their thinking. There are distinct differences between Level 2 and Level 3 students. The module leader suggested that problems are partly related to students' lack of critical thinking/enquiry abilities:

> I and colleagues can see a distinct difference between the second and third years because some of them certainly, not all, have honed those enquiry skills and critical skills by the time they have got to the third year because they have had to or else they fail. I think the second year there is a staggering level of naivety, they don't think they have got to enquire about things, they don't think they have got to ask about things...

The module leader could not explain, however, why students are finding the assessment increasingly difficult year-on-year. Colleagues on the module have discussed changing the assignment to a straight forward essay but are concerned that that would take out part of the critical thinking aspect of the assessment.

5 Interview Analysis - Students

5.1 Studying Society Module – Sociology

5.1.1 Students' experiences of the Studying Society module

All students interviewed on the Studying Society module were able to accurately explain the purpose of the module, and reported that they understood its objectives, although initial expectations of the module varied somewhat. Some expected it to be more about society in general rather than about *researching* society. In the words of one student who had taken the module in the previous year:

> I think again coming into formal education I really wasn't quite sure what to expect of the module. I think from the title I don't think it was totally what I expected. I think it was more a technical aspect of how to study, I think, as opposed to [actually] studying society. I don't think it was what I expected. When I came to do it, it was the technical aspect of how you can do research and the various methods that you use, so to me it was almost like a research methodology. When it was tagged onto studying society I thought it was going to be more focused on society somehow. (Past student, Interview 1)

This viewpoint was proffered by a student that had been away from formal education for a number of years. However, younger students, coming into university education relatively soon after their A-level studies also reported that the module was not what they had expected initially.

> I didn't have a clue what the module was about. I thought it would be to do with research methods as it is called Studying Society. I didn't realise that it would help a lot with other modules like essay writing. I didn't actually think it was going to be what it was but it was quite useful in the end. (Current student, Interview 1)

> I expected it to be something more interesting. It was interesting but not to a large extent because it was more statistics, you have got to do a lot of work on that. I was expecting it to be more involved in the society. I didn't know that there was going to be some geography and statistics. (Current student, Interview 1)

Similarly to 'mature' students, however, the objectives of the module had become clear relatively soon.

> I didn't really know what it was going to be about but once we got into it I started to enjoy it and it was interesting. I then had a grasp of what it was about, that it was trying to teach you skills to do with your work at university and your work after university. It was preparing you in a way for it. (Past student, Interview 1)

Despite reports from most students that the module was very relevant for a degree programme in Sociology, CDS, or the Social Sciences, a high number of younger interviewees felt that what they had been taught in the module could have been grasped quite easily

from other modules on their course and there were complaints that most of the skills taught were too basic and that the module could have been shorter. For example:

> There was a lot of stuff that we spent quite a lot of time on that personally I did not think was very important. I am sure it is not the same for everyone but to me it was extremely basic and extremely boring and it was just too much sometimes, especially when it was for two hours at a time in a little room. Things like spider maps, and I used to think 'you do this when you are little not when you are at university' and to me that was a bit bad. But there was stuff, like about the library and referencing, that was really good. It was just the other stuff that was a bit silly but that is only my opinion. (Current student, Interview 1)

> Personally from what we did I think I could have grasped in less than a whole term's worth of lectures and workshops. It was just too drawn out. The only thing I can remember was writing a literature review or something and having to go through it and underline certain words to show we could underline or put certain words in italics or bold and then make sure the indent was set. That is one thing I can remember from it and it was just tedious. (Past student, Interview 1)

> I think it is important because it does get you started but I don't know whether it can be cut down. It has helped but it seemed like it went on for ever sometimes. (Past student, Interview 1)

In contrast, mature students, who had been away from formal education for some time and who often lacked the basic skills held by younger students (especially those that were computer-based), reported that the skills taught in the module were essential for bedding them into their studies. However, even mature students felt that the module needed updating to a certain extent:

> In general I think it probably needs updating certainly from when I did it. It needs to move on a bit and I think somebody might have said something once, I had [name of tutor] for mine, and I think [they] said that it was probably devised at a time when not everyone would have access to a computer like we have nowadays. It is more common for people to have access more easily. I think it probably needed updating a little bit and perhaps some of it wasn't necessary, like using email, but I suppose it depends on everyone's background, maybe not everybody could use that stuff. I don't know. (Past student, Interview 1)

It would seem then, that the module was more useful for older students with less experience of recent formal education and computer use. However, one 'mature' student (who had taken the module in the previous year) commented that there were aspects of the module that would be more appropriate for younger students than for those with more life experience:

> To me, it was something I hadn't done and although I had done studying before I had never really done anything via a research method. To me having to use a library and to use the internet properly and not just for a bit of personal use it was really valuable. Some of it I had already done but I think that is probably because of my age and my job in some respects. Like preparing a CV. I have done CVs and have worked in human resources so that didn't help me, but I can appreciate it would for somebody coming straight from Sixth Form. (Past student, Interview 1)

A number of students experienced difficulties with keeping up with the work, which was portfolio-based, although differences between students appeared to be related to their

prior knowledge of the independent learning processes and skills taught on the module. However, even students who considered the tasks to be easy thought that there was a lot of work overall and that this impacted on their understanding of the content:

> The explanation of some of the tasks wasn't amazing but I think overall it wasn't too difficult. There was quite a lot of work, I thought, for it, considering some of it is so simple because I think in the end my portfolio was sixty pages or something silly like that, it was quite a lot of work. If you missed a week you were a bit lost. The handbook is good but there is quite a lot of work considering how little it is, especially if you have missed a lesson.   (Current student, Interview 1)

There were differences in how students perceived the assessments for the module. Some students seemed to prefer the portfolio-based assessments whilst for others a failure to keep up with the tasks each week meant that they had difficulties completing the work. There was some feeling that it could have been made clearer that completing the portfolio week by week would be easier in the long term, although one student did say that their tutor kept reiterating this. In addition, some students felt that it was not always clear what was expected for the portfolio, i.e. whether the booklets and tasks handed out were for the portfolio or were just general tasks meant to help with learning. However, other students reported that the module was really organised and that the booklets handed out each week contained a checklist for the parts of that week's work needed to be put in the portfolio. It was felt by some students, however, that an overall checklist of what was required for the portfolio would aid completion. These students tended to be those that had left all the work until the end of the module.

There was also some feeling that the requirements for the group presentation were not clearly outlined and this caused confusion:

> Some people didn't know whether they could do it [the presentation] on their own and some people didn't know whether it was in a group... ...It was a bit unstructured in that we didn't really know precisely what we were doing and what format it was going to take.   (Current student, Interview 1)

Younger students experienced differences in how they approached their work in comparison to older students – older students were more able to prioritise whereas younger students 'winged it more than planned it'.

According to interviewees their tutor's expectations in terms of the assessment was for a student to exhibit familiarisation with the processes taught and a firm understanding of what was being presented. One student commented that it wasn't clear what their tutor expected in terms of the assessments and what they should do to get a good grade. Producing the work seemed to be a case of following a set of given instructions:

> *What do you think were your tutor's expectations of you in terms of the assessment?*
>
> I'm not sure really. It wasn't really clear. [The tutor] was telling us what to do and then it was us using the handouts more than anything and completing it from that rather than [the tutor] teaching us how to do it.

Did you know what the difference was between what you had to do to get a good grade and just a pass grade for instance?

[The tutor] gave us the grading sheet. I was thinking about this today when I looked at the grades that I got for it. Back then I didn't really know whether that was good or not. Now if I got that this year I would be pretty pleased with that so I didn't really know how to get the good grade I just followed the instructions and I ended up getting that grade.

(Past student, Interview 1)

Students were happy with the ease that they could get hold of tutors if they needed any help with their work. There were not any systematic faculty mechanisms in place to help students improve and evaluate their practice but students emailed staff as and when required. Students were also very happy with the levels of feedback they received concerning their assessments. Feedback often gets linked to marking criteria with students being referred to appropriate learning outcomes. Some students appeared reluctant to read their feedback, however, especially in the first year of their studies. One student described why they were reluctant to go over their feedback initially and how it helped when they did so further on in their studies:

In the first year our tutors were always saying that students never read their feedback. I didn't in the first year because I didn't want to know what I was doing wrong even though I knew it would help me. I didn't want to know because it made me feel like a bit of a failure. It is not that they put it like that because I never read it. When I got to the second year and got my feedback from last semester and I made myself sit down, read through the essay... and as I read each bit look at the feedback that they had written and then made a list on an A4 piece of paper about what I need to do next time. That has been helpful because then I know what bits to improve. (Current student, Follow-up Interview)

One mature student described how this feeling of being a 'failure' associated with negative feedback seemed to be particularly prevalent for younger students:

If there is criticism of the work it is perceived that it is a criticism of them as a student. I think that is quite a problem for the younger students particularly. They find it affects their self-confidence and self-esteem. From the staff point of view they have to give feedback because that is part of their job and they are trying to help the students grow as students and academically. It is a problem. (Current student, Follow-up Interview)

5.1.2 Students' understanding of the development of knowledge within Sociology

Studying Society students were presented with a number of questions designed to assess their understanding of the development of knowledge within Sociology and its related disciplines. Initially students were presented with two hypothetical statements (supplied by the module leader):

(1) 'People in the worst post-code areas tend to suffer more ill health than those in the best post-code areas';
(2) 'The internet is not all it's cracked up to be'.

Students were then asked how someone in Sociology or CDS would go about checking the validity of one or other of the statements. The majority of students chose the first statement which was seen to be easier to unpick. In the words of one student:

> I'd do the first one as with this one you have more things to look into statistically and actual postcodes and ill-health. You have two major search areas there.
>
> *Is that where you would start... with your search areas?*
>
> Yes.
>
> (Past student, Interview 1)

Students who chose Statement 1 referred to the key words and research areas and described where they would go to find information:

> This one, the people in the worst postcodes areas; we were told to go onto the social trends website and look at that and you can search where the most deprived areas are and what sort of health they have got. There were loads of different things that you can click on about health, education and all that sort of thing.
>
> (Current student, Interview 1)
>
> The first one about the postcode areas, I would use a particular website that we used one week which I can't remember the name of but I have it written down in my handbook. You go into the website and type in a postcode and it gives you loads of different statistics about that particular postcode. One section of it is about the mortality rate in the area and how many people are suffering from a terminal illness so I would use that to get some primary evidence and then I don't know what else.
>
> (Current student, Interview 1)
>
> I would choose the top one. We did use the Studying Society part of it to look at this. We looked on the internet and we put in our own postcodes and it did show statistics. It was basically looking at the statistics of different areas.
>
> *What about if you were going to write a piece of work on that, how would you start?*
>
> I don't know, I can't think of anything I'm sorry.
>
> (Current student, Interview 1)
>
> I'm going to do this one [Statement 1]. I would find websites and look at books in the library, but websites particularly. The university recommends for research going on the .edu and ac.org [websites] so maybe looking at websites that aren't research-based but academic and see if they differ in their information from different comparisons and then write it up.
>
> *What ways would you go about starting to write that up?*
>
> I would start with a plan of the assignment and then just start and try and get into it.
>
> (Current student, Interview 1)
>
> I think it is social trends where they hold all the information [chose Statement 1]. This is where you can get all the statistics of all the different areas.
>
> *What if you were going to write an essay on them, where would you start with your literature search and what would you do with it?*

I would go for the social trends first of all and then take it from there. I would probably go into something to do with health and see if they could break it down.

(Past student, Interview 1)

For these students there was not a lot of depth to their answers and some students needed prompting from the interviewer.

Two past students chose Statement 2, even though in some respects this statement was harder to unpick as it contained less prompts as to what to look for. The following two quotes show the differences in the depth of their replies:

I think the internet one: 'The internet is not all that it is cracked up to be'. I would probably go with that one. We were taught when you are doing your research you don't just go onto any website and that Wikipedia is not trust worthy. You need to look at the addresses and .org and .gov are the ones that you should go for. You have to check the website address because they are the most trustworthy ones. From that point the research was the only thing we did about the internet and [the tutor] was telling us where we could go. He told us how to do searches on Google and how to do more in depth searches. (Past student, Interview 1)

If I looked at the second one: 'The internet is not all it is cracked up to be'. For me if I was researching that, from what I had learnt, I would just go to various places to read up on research that has already been done. So I would go to the library to find some books on the internet and there is nearly always an argument so you can try and find two sides of it. Try and find something not just from books but from other sources, newspapers and if I was going deep into it I could probably do a research project of some kind with questionnaires. Questionnaires were also something that we talked about in the module which I have forgotten to mention. Depending on what I had got to do I would utilise as many different avenues as I could to find as much information as I could. (Past student, Interview 1)

Whilst in the second extract the student refers to numerous sources for finding their information, discusses the possibility of running their own research in the area and refers to the research argument, in the first extract the student refers only to what they have been told about 'the internet' by the Studying Society tutor. Consistent with all the students who chose Statement 1 this student neglected to discuss the research argument or any of the research questions implicit in the statement.

As can be seen from the above extracts, the Studying Society module has had a marked impact on students' learning. However, some students (those who had taken the module in the previous year, in particular) reported that their learning was not only a consequence of taking the Studying Society module. For example:

All my lecturers, in every module, have sat down and dedicated half an hour and told us how to put our essay together, to start to plan it and what to put in it as in an introduction, conclusion etc. (Past student, Interview 1)

I think if I've learnt things like that I've learnt it more from when choosing which essay questions are best. I don't think I got anything like this in the module itself.   (Past student, Interview 1)

This was reiterated by a past student in a follow-up interview:

In terms of critical thinking, where do you find that knowledge has come from, like how to create an argument and analyzing other people's work?

I think we have learnt as we have gone along. It is not one main thing, it is bits from everywhere. If you have had your feedback from other assignments and they have said 'Well you are not critical there', or 'You haven't analysed it enough'.   (Past student, Follow-up Interview)

5.1.3   Students' transference of learning within Sociology

In general, students reported that the Studying Society module was a good tool for getting them started on their degree and all students interviewed felt that the module had had a beneficial effect on their academic researching and writing, and their learning in general. Some students reported they 'wouldn't have known where to start if I hadn't done the module'. One past student had not realised how important it would prove to be at the time of taking it:

I don't think you realise at the time and if you had probably asked me that this time last year I would have probably said 'no' [it was not important for helping the student to progress] but as time goes on... ...At the time it was just that new that you don't know what to make of anything. Until your first assignment has come in you don't really know. (Past student, Interview 1)

One student at follow-up interview even reported that they were still using things that they had been taught two years previously in the Studying Society module:

I designed my own questionnaire so to do that I looked through my notes from Studying Society and Researching the Community [another Sociology module that teaches research skills] to just give me a basic broad idea of where to start.

So it has been useful then even two years after you have been taught it?

Yes. It sort of reminds you of things that you have actually forgotten about.

(Past student, Follow-up Interview)

Another follow-up interview student described how transferring learning across modules is being aware that you have actually learnt certain skills:

...it is to some extent an awareness that you have been learning these things and these skills so that when you are set assignments or seminar tasks, if you are then sent to go and look up certain research in the library it is expected that because you have done the Studying Society module you will therefore know at least the basics of how to do it. If you don't then it is often a problem like 'Why don't you know how to do it because it was in a core module?'   (Current student, Follow-up Interview)

The most essential things for progression seemed to be referencing, finding out about the different research tools and learning to analyse the literature:

......like I've said with the referencing. Now I can go back and look and see how I did it. We did one thing on analysing someone's work and that was quite useful because, with Sociology you

need to look at different points of view, and that was good because writing essays you need to look at different points of view. That was helpful as well… …Studying Society helped me when I was doing different modules last semester e.g. my Social Policy… going away and not just looking at website and books but looking at E-books, E-journals, journals, periodicals and newspapers. I think it will help me in the future as well because I can look more deeply. I have spoken to some of my other friends and they haven't used newspaper or periodicals so it is helpful in making you use other sources. (Current student, Interview 1)

I used to surf and take all of the information without actually seeing the differences like searching from many search engines. To some extent it has taught me to analyse most of the things. (Current student, Interview 1)

I think it has [helped with other modules]. It taught us how to get into things and how to start. It has definitely helped with referencing and bibliographies and the assignments because I didn't have a clue about that. That was really useful and that has helped right up to now. (Past student, Interview 1)

I know now to break my research up into smaller bits and research that section, then move on, so not [to] do everything all at once. (Past student, Interview 1)

One (mature) student even reported that the techniques taught in the module had helped in their job outside of the university:

Yes, even at work when I have been thinking about things there. The module in general has opened my eyes totally to all sorts of things. Even at work I had never done research even very simple or basic research so it just makes me realise what is out there and that it is not just on the internet or in the library. It is just surprising and it has really helped me. I do think it is a necessary module but needs updating. (Past student, Interview 1)

However, some students were unsure as to whether these benefits were only as a consequence of taking the Studying Society module:

Yes and no [whether the module has affected their work on other modules]. I do look at things more critically like research and stuff now but I don't think that is just from this module because it has brought up a lot in other subjects anyway like how to reference. It has been mentioned in pretty much every module that I have done in the first semester because obviously everyone is new. How to reference, how to use the library and things like that, [there] have been tasks in those as well. Although that module [Studying Society] has been useful, it has been brought up in others anyway.

(Current student, Interview 1)

I think the more assignments I have done the more I have learnt where I have gone wrong.   I wouldn't necessarily put it down to Studying Society.

Did it not specifically address critical thinking or anything like that?

Yes but not to the degree the assignments [of other modules] do, because that is a portfolio [the Studying Society assessment], where as the others are just straightforward essays.

Does the Studying Society module give you any tips or any ideas on ways to go around critically analysing things?

Yes it does but I think you understand it more when you have done one [an essay] and the lecturer can point out where you have gone wrong.

(Past student, Interview 1)

Students on joint awards commented that what they had learnt on the module was also useful for their work on their other award. One student, who had transferred from a joint Sociology/English award to a single honours Drama award, reported that the concepts taught in the Studying Society were useful for all three courses. Another student reported that the interviewing techniques taught in Studying Society were useful for their work on the Journalism aspect of their joint Sociology/Journalism award.

> I didn't know how to write a bibliography properly, not in the way that they expect until I did the module. I still use that now and refer to some of the handouts to check as he noted down some examples. That was the most useful thing that came out of it. CV writing helped as well. I knew how to do it but he showed us how to do it properly and professionally. (Past student, Interview 1)

The Studying Society module is one of a group of modules in Sociology/CDS which as a whole teach students a comprehensive set of research skills designed to take students through their degree. Students reported that other modules taught by the module leader from Studying Society have a section that refers back to the Studying Society module. As also reported by students, other modules on Sociology/CDS awards assess students on the types of things taught in Studying Society and all modules require assignments to be completed in similar ways. There does not appear to be any formal linkage between modules, however, and student reports were conflicting as to whether tutors on other modules specifically referred to the Studying Society module. Despite this, students were unanimous in saying that the Studying Society module is there to create a basis for work on other modules. Students involved in follow-up interviews who had taken the Studying Society module two years previously reported that the Studying Society module was not mentioned at all in Level 3. One follow-up student (who had taken the module one year previously) suggested that it is more implicit than explicit that processes learnt in Studying Society are to be transferred across modules:

> I think it is more of an implicit assessment in that the quality of your research, analysis, how you perform an assignment, how you write an essay/report and I think the big thing that people are really looking at is referencing, and that was a main focus in Studying Society and in the subsequent Research in the Community [another Sociology module]. I think the issue is why do students still have such a problem with basic attempts at referencing? I think that is probably the main overt thing where it does keep coming back, but mostly it is implicit. (Current student, Follow-up Interview)

5.1.4 Students' perceptions of research-informed teaching within Sociology

The Sociology Department places a heavy emphasis on teaching students to do research. Students do not run active research projects in the Studying Society module but are expected to do so in subsequent modules, and throughout the rest of their degree. One student described why, for them, the level of research they are taught is appropriate:

> I think so yes [there is enough emphasis on research]. I think you are taught at such a general level that the students who need to learn everything there is to learn from a, b, c, right through can learn what they need to learn (or they have the opportunity to do so). Students who maybe can pick things up quite quickly, or they have already got some background

knowledge, can pretty much do their own thing and go off at their own level and just check back in with the tutor for guidance. It works very well in that way. (Current student, Follow-up Interview)

Students reported that what they were being taught on their Studying Society module and their Sociology award in general was relevant to the research currently being undertaken in the wider discipline. Lecturers discussed their own research in class and students found that this helped them to more easily understand what they were taught. Students would have liked lecturers to use their own research as examples more often because:

...I think it would be quite interesting for us to see what they have done and to link it to the real world. (Level 2, Follow-up Interview)

It is easier to explain to people what you have done and how that relates to what you are trying to get people to do. ...It is interesting to listen as well.   (Past student, Follow-up Interview)

All five students who undertook follow-up interviews seemed confident in knowing what learning to 'do research' is for. Below are some examples of their replies:

What about in terms of the wider discipline? Why do we do research?

I think... I can't remember the guy's name but he said 'There is nothing as practical as a good theory'. The theory makes sense of the world around us. That is what research is really. It is how we are making sense of the world around us and in whatever discipline that is what we are doing. We are looking at facts and statistics and we are interpreting them to how we interpret the world around us.

So would you think it is an essential part of your award to learn how to do it?

Oh God yes, absolutely.

(Current student, Follow-up Interview)

I think a lot of the time confidence building is one of them but academically I think it is to do with getting you used to doing research and then comparing that to theory, like secondary research. It is about understanding the difference between primary and secondary. It depends what job I go into but I might use it in the future and I might not. It is still a useful skill to have and to put on your CV that you have done a research topic. A research project is quite a big thing. Also I think it will help with the dissertation because we can do primary, secondary or content analysis. It is going to help me choose whether I do that and if I like it or not. (Level 1, Follow-up Interview)

Research means for me going out and getting personal opinions of other people, of society groups, and seeing what these things mean to different people... ...It's just to see what society feels and to just gain an opinion and see where to go next with things. I think students do need to develop research things [processes] and it can lead onto other things after university. (Past student, Follow-up Interview)

These students all understood the value of research and felt that their understanding of research and research processes was good. Students on Sociology modules are required to run active research projects throughout their degree and they see doing so as a positive and useful experience. One student describes their feelings about running their own research project and collecting their own data:

I think it is just to get a concept of what is already known about what you are researching. It also gives a further knowledge of what you are learning about, like if you are researching more in depth you are obviously finding more out about things that you might not have been told in your lectures or seminars. I think it is just to get a grasp of what has been already done and how you could add something to it that is different.

Do you think that developing research techniques is essential for your award?

I think so yes. I think with everything that you do you need to research things to understand how you approach things.

(Past student, Follow-up Interview)

Some students found that doing research themselves can at times be quite difficult but very good for building self-confidence. The following quote illustrates this point:

Last semester with the Research in the Community one [module] we had to go out and do one in depth interview and I think we had twelve questionnaires so we had to get twelve participants. It was an oral questionnaire so we had to read it to them. That was quite a confidence builder because we had to actually talk to strangers and that kind of thing. The one in depth interview had to last 45 minutes and everyone was like 'Wow, how do I do that?' That was the first piece of big research that I have properly done since doing questionnaires at school. I only managed to make it last about 30 minutes in the end. I did mine on prostitution, drug use and poverty so it was quite a deep topic as well. It was difficult to keep it going. (Current student, Follow-up Interview)

Students also reported difficulties with learning statistics. Such difficulties often put students off running quantitative research projects for their final dissertations as they did not want to risk 'bring[ing] my whole mark down'. Consequently, they chose to run qualitative research projects instead.

5.2 Project Preparation and Planning Module – Geography

5.2.1 Students' experiences of the Project Preparation and Planning module

On the whole the Project Preparation and Planning module was received very well by students. All students were able to accurately describe what the module is trying to achieve and were fully aware that the skills learned were expected to be transferred to the Level 3 project/dissertation. There were some inconsistencies from students as to whether the module met their expectations and how they felt about the overall objectives of the module, but these were minor. The majority of students reported that the objectives of the module were outlined quite well and that it met with their expectations. For example:

I think basically it was to help the students build up knowledge about what they wanted to go into for the dissertation. A lot of people had ideas of what they were interested in, come the second half of Level 2, but people weren't sure exactly how to necessarily go about using those interests and doing them as part of a project. That is what I thought would be the main thing, to understand what you could do towards whatever your interests were and see how you could go about creating a project from it and doing your dissertation.

Did it meet with your expectations?

Yes it did. From my point of view I had a lot of ideas based around one theme but it really focused me more specifically once we had started the module.

(Past student, Interview 1)

However, one student reported that the module did not help them with structuring the dissertation as they had expected, but that this was information they received from other modules anyway and, therefore, was not a problem. Another student reported that the module was more along the lines of a lecture rather than showing them how they could do their project. They suggested that it didn't quite meet the objectives as outlined:

I would have thought they were about preparing you to know what to look for, and how to go about certain things, and what is going to give you the best results, the best way of actually looking at things and preparing to do. It didn't actually do that.

So it didn't do that, what did it do?

To me it was more along the lines of a lecture and okay they were telling you a little bit about how things have been approached before... ...It was more of a lecture (getting back to the question) rather than showing you how you could do your project.....

.....The title says preparation for planning your dissertation and the objectives therefore would be more in the planning. Actually the objective wasn't reached because it wasn't telling you about the planning it was telling you about how other people look at planning.

(Past student, Interview 1)

Another student felt that the assessments were very useful for giving an insight into what the module was trying to achieve:

....it was very broad when they first mentioned it to us. I didn't really fully understand. I knew it was about the dissertation and I knew there were going to be lectures and different forms of assessment. There was the oral presentation, the proforma and the general essay about the topic that you were doing. I didn't really get a lot of insight into what it was about until I properly started it. I think it was probably the assessments that gave me more insight into the purpose of the module than the lectures or anything associated with that. (Past student, Interview 1)

All students felt that the module was very important for a degree programme within Geography because it taught you transferable skills and they said that it was better to have taken it than to have not taken it. Level 3 students specifically reported that whilst at the time of taking the module the benefit of it was not always apparent; as they started to work on their dissertation (and essays for other modules) they could see where what they had learnt on the module came in. At least one student reported that they would not have had a clue what to do on their dissertation without taking the module. Whilst taking the Project Planning module was seen as important, one student who had said at the first interview that they thought taking the dissertation (the companion module to the Project Preparation and Planning module) was important for a degree in Geography had revised their opinion by the follow-up interview. They felt that taking the dissertation was too intensive and they were not actually learning any new skills:

Last time we spoke you said that you thought doing the dissertation project was important for a degree within Geography. Are you still of the same opinion?

No not really. My housemate did Forensic Science and he had the option to pick up two more modules instead of doing a dissertation and now that I have gone through all this work... it is just the fact that so much pressure is on this one piece of work. When I was in the first year I always assumed, I don't know why, that you only do your dissertation in the third year. Now that I have got here and I have got the dissertation and all the modules as well it is so much pressure. I would have preferred just to have done two more modules than the dissertation.

So you feel that it would break it up more?

Yes. It is only an extended report. We have been doing reports since the first year so it is not as if it is a new skill as such.

(Current student, Follow-up Interview)

Students reported difficulties in time management and achieving deadlines for the assessments. The assessments are linked to what a student is intending to do for their Level 3 research project and finding a starting point and formulating research questions was perceived as one of the major challenges for students. In the words of one student:

It doesn't ease what you have got to go out and do. You have still got to go out and research something and find something that you are interested in and that you want to do and then go from there. All of your background is going to be done from there, not from somebody telling you 'Oh, this is how people do it'. (Past student, Interview 1)

Students reported that the guidance of their tutor was essential in helping them to deal with these types of issues. Some students felt that trying to formulate a topic and find a starting point from the lectures was quite difficult because they were presented in terms of very broad concepts whereas students' projects were very specific. This can be seen from the following extract:

Often you weren't always aware that the lectures were telling you something that was relevant to your project. (Past student, Interview 1)

There were also requests for the paperwork connected with the module to be provided rather than students having to get it off the internet. Students reported that looking on the internet for work could be time-consuming and often they only knew the work was there because of another student asking 'Oh, have you done the work that we were meant to do on the internet?' One student reported that they were 'still getting used to the "go off and do something on your own" approach'. This is in contrast to other students who were very happy with how the module is run. It was apparent that there were differences in how mature students and younger students approached their work, with the younger students waiting to be told what to do and the mature students taking a more proactive approach. One 'mature' student commented about his experiences in comparison to younger students:

Did you find any differences between how you approached your work and how other students approached theirs?

I think I have. Being a mature student it helps a little bit that does, I think it really does help you. You have got different views on things and I think that it hinders you sometimes, being a mature student, because you are starting from two different levels. A student coming in from A-level is starting from a lower level with less life experience and they are working their way up the scale whereas a mature student has got more experiences and has got more views. Those views can be biased so you are working your way back down. Somewhere in the middle is the meeting point for it…..

…..I have tried to help a few people that have asked me and said they are really struggling with this and asking what I think they should do and I have helped them. I have tried to point them in the right direction because I found that, whether it was right or wrong, I read lots of journal articles and tried to get the general gist of what people are doing and how they go about doing a report so that I could use that for my dissertation. They [younger students] didn't seem to involve themselves with that too much and were just going along step by step. Whatever anybody tells them to do, that is what they do. They don't actually go out and try and find things for themselves they just do what they are told to do. That is fair enough because at that age you do what you are told to do. I don't because being a mature student I am coming at it from a different angle. In some ways it has helped but in some ways it has really hindered me because it does then focus your writing in a different way.

(Past student, Interview 1)

There were definite differences in how students viewed the module in terms of using it as a starting point for their dissertation. This student described the benefits of taking the module:

The hope was that it would give me more confidence doing my dissertation because obviously with that being quite a large section of my degree I didn't want to go into it thinking 'What do I do?' 'Where do I start?' I assumed, reading it, that that would be the idea of the module i.e. to arm you with more information to get your dissertation kick started. It also meant that you could do it over summer as well, whereas if you start at Level 3 you could think 'What do I do now?' (Past student, Interview 1)

However, the same student felt that some of the other students did not take the module seriously because they could not understand why they were starting on their dissertation topic so early:

A lot of people didn't take it seriously because they couldn't understand why we were doing it in January for a dissertation starting in September. Three of my housemates certainly didn't bother picking a project area or doing it properly but it has got to the stage now where we have got three weeks left and myself and the other housemate who did put the effort in back there are the two who are done and we are sorted. There was definitely a difference in approach. (Past student, Interview 1)

Another student reported how some considered taking the module to be a waste of time. This extract also indicates how, if problems occur with choosing the topic for the Level 3 dissertation, this can have a knock on effect for a students' work in Level 3:

When we started off the module I think a few people thought it was just a waste of time. However, when you consider you are getting a module which is fifteen credits towards your degree – which the whole module was designed around – getting your thirty credit module in

your third year, it is not a waste of time at all. As I went through I realised more and more how this was going to benefit me.

In what ways were the students saying it was a waste of time?

A lot of people considered that they were not going to use what they had done for the Project Planning module in the third year project, whereas you can. You can do everything, prepare and then over the summer do your research and you have got a year to do it. This makes a lot of difference because I know a lot of my friends have done that idea and they have had their summer to do the research. I didn't, I came back to university and basically started from scratch. I then had another problem which meant I couldn't start my research until December which means I've only finished my research a few weeks ago. Now I have to write the whole thing by March.

And that was because you changed your mind [on the topic] and you came up against problems?

Yes.

(Past student, Interview 1)

Some students were very clear on what was expected from them in terms of the assessments as can be seen from the following extract:

What do you think were the tutor's expectations of you for your assessments in terms of the levels of what they wanted you to produce?

With it being third year they have always emphasized that, compared to the other two years, they want a more analytical approach. Not only reading the research and understanding it but trying to actually come up with your own opinions and formulating your own concepts and agreeing/disagreeing with what was being said. I think they were trying to make us almost interrogate the literature we had on offer and that is probably the main thing that they really emphasised for us to try and do.

(Past student, Interview 1)

However, differences in supervisory practices meant that not all students were so clear in their perceptions of what was expected from them – some commented that their tutor outlined exactly what was expected from them and was very clear on the assessment procedures, criteria and deadlines for submission, whilst others reported that their tutor took a more laid back approach and it was not always clear what was required. The following extracts indicate the differences experienced:

Have they [tutors] given you ideas about what criteria they are looking for?

Yes. At the beginning when we started meeting our supervisor we did some reviews of previous dissertations which was useful because we could see what others had done. It was reviews of different levels like we saw an A and a C dissertation.

(Current student, Interview 1)

What do you think your tutor was expecting of you in terms of the levels you were producing in your work?

If I had a different tutor I probably would have had more idea and preparation with my work. Instead I had to go off, do things on my own, talk to other tutors and get ideas from them as I couldn't get hold of my tutor sometimes. (Current student, Interview 1)

You get a lot of one to one time with your tutor to discuss where your project is going and then, for your essay, you would say 'I want to look at this, this and this' and then your tutor can say whether you are missing anything. They kind of give you a lot but it is still left up to you to go out and do it.

(Past student, Interview 1)

Students reported that it is generally quite easy to get hold of their tutors if they require help; students simply have to email their tutors. There does seem to be some imbalance in help given, however, with some students receiving more help than others. Students are generally happy with the feedback but some would like more one-to-one feedback. For example:

In the first year every time you had an essay, or when you got one back, they brought you in and you talked through it whereas they don't do that anymore. They just give you the cover sheet which has got the written feedback on. I would prefer for every essay to have verbal feedback.

If you wanted that verbal feedback could you actually go and make an appointment with somebody and get it and discuss it?

I don't know. It doesn't seem to be high on the priorities at the moment in terms of the lecturers. …They are thinking about [us] getting our dissertations done.

(Current student, Follow-up Interview)

5.2.2   Students' understanding of the development of knowledge within Geography

Project Planning students were presented with a number of questions designed to assess their understanding of the development of knowledge within Geography. Initially students were presented with two hypothetical statements (supplied by the module leader):

(1)   'Organic food consumption will be related to spatial socio-economic patterns within a city';
(2)   'Land use determines the microclimate of a landscape'.

They were then asked how someone in Geography would go about checking the validity one or other of the statements. Examples of students' replies are given below:

The first one; you would look at the population within the city to work out where the poor areas were and where the wealthy areas were. As a generalisation you would expect the wealthy people to be more concerned about eating organic food than the poorer people because it is more expensive. I think I would probably start with that and see how it goes.

What if someone asked you to write a piece of work on that…?

Personally I would define the technical words within the statement to start off with and then I would go about describing the population patterns, then talking about the general organic food consumption and then compare the two.

(Current student, Interview 1)

Statement 1 - if I was given that statement I would go into the library and type in key words from the question and see what comes up from that. Then get the books out and do some

reading, get a general basis and then search for journals and try and find out what journal to start looking from and have a look through. (Current student, Interview 1)

I would probably choose the second one because it is more physical; 'Land use determines the micro-climate of a landscape'. The way I have always been taught to do it, and the way I have found most useful, is to try and pick out the key words, in this case 'micro-climate' and 'landscape'. Take them in isolation and try and define them and then try and come up with ideas of how you would link them together. (Past student, Interview 1)

I will choose the second one. How I would go about it would be initially look up the reading so I would probably refer to journals of urbanisation. Get the essential reading out of the way so I would type things out and you could do that online as well. I would either go to the library or spend a session downloading articles from the internet. I would read through those, start to form my initial ideas in a draft word document and then, if I needed to go further, I could look at the census data that the university has access to and look at temperature variations in urban areas on a map. (Past student, Interview 1)

In general, the types of responses received from current and past students were similar, although current students tended to need more prompting from the interviewer. Students referred to the key words and outlined where they would search for their information. However, they did not discuss the research argument or any research questions implicit within the statements.

Students reported that their learning to validate statements in this way was, in part, a result of what they had learnt in the Project Planning module; the module had taught them to analyse the question first, i.e. 'It's like a mind map based on the question', and helped them to plan their research questions and analyse information. In the main, however, the majority of students (especially those who had taken the module the previous year) suggested that their learning was as much a result of taking other modules in their degree as taking the Project Planning module. Comments included:

I would say to an extent it was. It is something that has been emphasized in the first two years of university. At the start we had to go about it our own way because they didn't give us a lot of input and we had to find our own way. I think the further we have got into it they have given you more guidance. This is the one thing I have noticed about the third year the most really. You have to try and breakdown the question then try to make inferences and links accordingly....

So it wasn't completely related to the Project Planning module?

Not entirely. I think it was a skill that we have learnt in other modules and it was probably in preparation for this module the most.

(Past student, Interview 1)

If you are going to answer a question you need to find out so you are going to use a library because that is where most of your information is going to come from. Since half way through first year we were introduced to the journals and what they were, using newspapers and the ways of searching through them, also how to use the internet and library researching. You just need to use this stuff to answer your question..... ....Project Planning hasn't come into any of this answer as it is just general stuff I already know. Project Planning was mainly your approaches to doing a project but I haven't really taken much of that into account if I was just to answer a question.   (Current student, Interview 1)

A lot of our course is coursework based so we haven't had any exams since the middle of the second year. A lot of it is done through essays and report writing so it has probably come from most of the modules in a round about way. (Past student, Interview 1)

5.2.3   Students' transference of learning within Geography

Past students reported that the Project Planning had been very beneficial for their Level 3 Project and for academic researching and writing in general:

> It has in little ways. I plan my essays better now instead of just writing straight away. I research and then take what I need from the research and then put it into an essay, which means my essays are better. Other than essays or reports no, because we only have to do those.
>
> *So when you transfer the concepts across can you use those concepts exactly as they are, in other modules?*
>
> Yes, we had to do a project for another module which was only 3,000 words but basically we went out, had a look at some books, did our own research and then wrote up what we found. What we found in terms of what it actually meant for the broader sense of the literature we probably wouldn't have been able to see what we needed to do if we hadn't have done the Project Planning module.
>
> (Past student, Interview 1)

However, in contrast to the majority of past students, the following past student did not believe that the module had helped them with their essay writing:

> Yes I suppose in a way. It is a new approach almost, or it teaches a new approach, that you look at things in a certain order, in a certain way in order to get the information that you need before starting, so in some ways yes. I was always quite organised about how I did my plans and stuff for essays so if I was given an essay title I would start by making a plan of what I was going to do, so in that respect maybe it's not so new. What I didn't do was identify gaps in literature because it is not essential for an essay. You don't need to be writing a piece of literature. With your independent research project that is almost a piece of literature that could be published so it's a very different approach than for writing an essay. Yes it has affected the way in which I do my work in some ways but only the pieces of work that fit with the module. With essays it is not really any different because it wasn't applicable. (Past student, Interview 1)

Current students had not at the time of the interviews produced assignments for other modules and were not able to say as yet whether the module had been beneficial in the rest of their academic work. When two current students were re-interviewed at follow-up they both reported that their work on the Project Planning module had helped with their work in other modules.

> Yes actually, in the first year and second year it was just a given that you put references in and how you structured it. You were almost expected to know but then when we actually sat down and had to do it for the dissertation... and I kind of applied it [learning acquired from the Project Planning module] to all of the stuff I have done in other modules this year. (Current student, Follow-up Interview)

Both current and past students reported that the module had provided them with the confidence to look at a wider range of research for their project. A number of past students reported that the proforma used in the Project Planning module was the most important for helping them with other modules. For example:

> I keep going back to the assessments. The proforma mainly, it broke down essay questions and made us focus on the main aims and objectives and then the ways that we were going to achieve this. I think the proforma for that module is the one thing that stuck out the most in trying to incorporate into my other modules. (Past student, Interview 1)

It would appear then, that the module, and specifically the proforma, has helped students to be more specific and focused in their researching and writing. One current student also commented how the module had taught them to criticise other people's work, and how to recognise whether or not what they themselves had written was capable of getting a good mark.

Students reported that other modules on their course had assessed them on the kinds of processes that they learnt in the Project Planning module and there was an expectation that the processes learnt in Project Planning would be transferred. The things that students were asked for in other modules matched up with what they had been taught in Project Planning.

> It is the same kind of material in some respects. They are all singing from the same hymn sheet, we are not being told to do three different things by three different lecturers, one of which did Project Planning and the other two did other modules. (Past student, Interview 1)

Specifically mentioned was the value of presentation skills. These were included as part of the Project Planning module and were also assessed in other modules.

Elements of the Project Planning module are discussed within other modules in the Geography degree programme and assessment requirements tend to be consistent across all modules. The module is actually part of a cohesive set of enquiry-based modules that take the students to the end of their degree and students were fully aware of this fact. In the words of one current student:

> It's all really linked, I think, for Geography. Everything fits in together. I suppose that is the same for everything, it all builds on each other.   (Current student, Interview 1)

There were conflicting reports from students as to whether lecturers from other modules on the Geography programme made reference to the Project Planning module; some students said that they did, some said that they did not. Even those students who said that other lecturers did reference Project Planning were unable to report exactly *how* the Project Planning module had been referenced. However, the consensus of opinion from *all* students was that 'they [the Geography department] always try to link the modules that you are doing'.

5.2.4 Students' perceptions of research-informed teaching within Geography

The Geography Department places a very heavy emphasis on teaching students to do research; a high proportion of the modules are research based and students are quite heavily involved in running their own research projects. Lecturers quite often discuss their own research in lectures. One student explained why this is useful:

> I quite like it when they do [discuss their own research].
>
> *Does it help you when they do?*
>
> Yes because when they talk they generally talk about what they have been doing, not how they have done it, but it just sparks a bit of enthusiasm in everyone else. I think it is just the enthusiasm that helps not necessarily what they have said if that makes sense.
>
> (Current student, Follow-up Interview)

Students felt that what they were taught is relevant to research in the wider discipline and they can easily connect it to current research. There were reports, however, that while the Project Planning module and content of the course were up-to-date, the books and journals in the library were not and this impacted on their work. A lot of students' research is therefore internet based.

The two students who took part in follow-up interviews felt that learning how to do research was very important for their degree. The following quotes illustrate how they see 'research':

> It is to gather data. It's about providing results for a question. ...Just looking to see what has been done before.
>
> *Do you think there is a value in doing research?*
>
> Yes because you don't want to write about something that has already been discovered.
>
> *For your award do you think that development of research techniques is essential for you to do your award?*
>
> Yes.
>
> *Why specifically?*
>
> Mainly because with every essay you are always writing about previous geographers that have done certain things. You want to draw on their research and their expertise almost and to improve what you are writing.
>
> (Current student, Follow-up Interview)
>
> We do it to gain knowledge and to further understand. That is it really, that is why we do it.
> (Current student, Follow-up Interview)

Both of these students reported having a good understanding of research and research processes, and both felt their experiences with research were positive. For example:

> Well definitely positive. Even after just general lectures, we always have key text for each lecture as opposed to just the module, so if you do a little bit of research after that you can

always find things which are quite interesting. You can end up going on a little tangent though. That is good. Even if it is not leading to any kind of work it is still good to do. (Current student, Follow-up Interview)

One student would have liked to have done more active field research than they are already required to do on their award, partly because they really enjoy it but also because they felt it would have benefited their studies.

5.3 Critical Thinking in Management Module – Business

5.3.1 Students' experiences of the Critical Thinking in Management module

Most Critical Thinking in Management students were able to describe what the module is trying to achieve and what the key benefits are proposed to be. In the words of one student, the module was there to 'give us an edge over other students like how to write essays, what to do and what not to do'. However, few students knew what critical thinking was prior to undertaking the module and expectations of what the module would be about varied from student to student. For example:

> I imagined it to be, in terms of critical thinking, just looking at certain business aspects and looking at them critically, we then later learnt that it was more about generalisation of critical thinking so it could apply to anything. At first I thought it was just critically assessing certain situations but the actual main topics were far more useful than just that.

> (Past student, Interview 1)

> I just thought it would be more about the way we think about things in Business.

> *Did you find that was what it was?*

> It wasn't quite what I expected.

> *In what way?*

> The way I thought it would be was situations in Business and how we should think about them, like there are two sides to every story. When I started the module it was more about conclusions and research.

> (Current student, Interview 1)

Views on whether the module is important for a degree in Business were conflicting. The split seemed to be between current and past students with current students considering the module more important than past students. In the words of one current student:

> *Do you feel that taking the module is important for a degree in Business?*

> I am 50/50 really. I believe it does help you to look at data but not only that, it helped in setting out an assignment and looking at the references. [The tutor] made us use academic references. Before for my course work, although I did get quite good grades in it, I was just using any reference off the internet. In that way it really helped. In other perspectives I don't know how you apply critical thinking to some cases like a case study. With a case study you

have got the evidence and you can tell that the examiner usually wants you to follow a set pattern, so I can't see how you apply critical thinking to that part.

(Current student, Interview 1)

Another current student thought the module was not relevant – they felt that it was a 'general module that everybody should know about' and that they would rather have done something that would have helped more to their degree. This student understood the concept of the module – that it was there to provide students with concepts that could help them in all areas of their degree – but would still have preferred to have done something else. Although this perspective was in the minority, current students appeared to find the module less relevant than past students. Reports from past students would appear to indicate that the module becomes more relevant as students move through their studies. Indeed, one past student reported that they didn't see the point of the module whilst taking it but that the value of it had become clear in the final year of their degree programme. Two current students who did not see the value of taking the module at the time of taking it had reversed their opinion by the time of the follow-up interview, when they were close to the end of their studies. The following quotes illustrate its importance:

It [their opinion] has changed yes. I think that it is important now. I didn't realise that at first but now that we are doing the project and research methods it fits in with that.

What have you found specifically important? What areas of it have you used?

The critical literature reviews and stuff that we have had to do. It has helped with how to critically analyse the research.

(Current student, Follow-up Interview)

A lot differently really, I do think it [the Critical Thinking module] is important. I think it can be misunderstood; Critical Thinking. It is more like analytical thought and without it you are not going to get 1^{sts} on your coursework, I don't think. It is all about seeing both sides and weighing up the logic.   (Current student, Follow-up Interview)

In general, past Critical Thinking students believed that the module was very important for effective resolution of their degree but one student felt that they would have been able to achieve a comparable level of work without taking the module:

Do you think that the types of things that you learnt in that module were important for a degree in Business?

Yes, but I'm not sure that I got anything more out of it as opposed to other friends who didn't do the module. They have picked up things from other teachers and lecturers who said bits here and there.

Do you find this from talking to different students?

Yes because I was the only one of my friends who did that particular module. I don't know that I did anything in that module that they haven't.

(Past student, Interview 1)

In the main, students experienced very few challenges or difficulties taking the module. There were a few reports that the group component of their work was problematic in that if some members of the group did not 'pull their weight' or do the work, or did not do it very well, then it affects the grade of the group as a whole. However, one past student reported that working in groups was beneficial because you could learn things from other group members. Some students reported difficulties conversing with the non-English speaking students in their groups. One student reported that they found it difficult to find research to back up their work.

Another student reported that it was difficult applying the concepts they were taught in Critical Thinking in other modules as each one required things to be done in a different way.

> *What do you think in general students thought were the challenges and difficulties of the module?*
>
> Applying the concepts and theories, that subject may have been taught to you differently to other ones, like how other lecturers tell you to approach an essay.
>
> *Did you find generally that other lecturers were telling you different ways of approaching things?*
>
> Yes, in every module I have done the lecturer has said something different.
>
> *Have you found this difficult?*
>
> Yes because it depends how that lecturer is going to mark it and you have to change your style to how they want it.
>
> (Past student, Interview 1)

The same student also said that different tutors *within* modules sometimes asked for things to be done in different ways and this made things even more confusing. This student's opinion was, however, in the minority. In the main, students felt that assessment requirements were consistent across modules on their degree.

In general, students were clear what was expected from them in terms of the assessments for the Critical Thinking module. One current student reported that:

> [The tutor] expected you to apply critical thinking to each part of the argument. [The tutor] wanted you to look from both sides of the argument; [they] didn't want you to be biased to one cause. [The tutor] also didn't want you to look at it as a personal essay, they wanted it to be in the third person... ...[The tutor] was quite clear about referencing and what styles of referencing [they] wanted. It was all set out.   (Current student, Interview 1)

Another student reported that the criterion for assessment was repeated by the tutor in every lecture and that this helped with their understanding. Some students experienced differences in how they approached their work in general and how other students, who had not taken the Critical Thinking module, approached theirs. They felt that taking the module made it easier for them to assess what was wanted in other modules. One student reported how the way the module was presented was different than how other modules were presented and that this was beneficial:

In taking the module did you feel that students on a whole came across any challenges or difficulties?

No, not really. I don't know whether it is [name of tutor] who lecturers this module but I found, with [the tutor], [they] really get you to explain and think about your answers and your conclusions. That made it a lot easier because, although it was difficult at first because [the tutor] asks a lot of difficult questions that you can't necessarily answer, you will give [them] an answer and [they] say 'Why?', [they] make you think so it makes you understand it a lot more thoroughly than some other modules where you might just be reading through scripts or lecture slides. Understanding it wasn't really an issue.

(Past student, Interview 1)

Students reported difficulties getting hold of tutors for help on occasion. There were no formal faculty mechanisms in place for students to reach tutors, they just had to email them and students reported some problems with delayed responses. They felt this was partly because there were so many students on Business awards. They also reported delays in getting feedback for assignments. Students were more than happy with the quality of feedback, however. One student stated:

They were brilliant with the feedback. The things that they gave me helped me to get [grade] 14 in the next piece of the coursework. ...It was great. The tips they gave me were brilliant because it was only small little mistakes I was doing in my coursework and it has changed my whole coursework. (Current student, Follow-up Interview)

Another student stated that when feedback was related to assessment criteria this was even more useful:

It [feedback] is [useful] yes. They do give you a feedback sheet and in some modules they give you an extra sheet where they have shown the marking criteria to see where, on a level, you were with each question on that point. They do give you some feedback as to 'If you did this it could have given you a better grade'. I do find this useful. (Current student, Follow-up Interview)

5.3.2   Students' understanding of the development of knowledge within Business

Critical Thinking students were presented with a number of questions designed to assess their understanding of the development of knowledge within Business. Initially students were presented with two hypothetical statements (which were supplied by the module leader):

(1)   'Large businesses tend to be more efficient than small businesses';
(2)   'The most effective way to get people more motivated in this business is to offer more money for better performance'.

Students were then asked how someone in Business would go about checking the validity of one or other of the statements. Level 3 students gave more complete responses to this question than did current students, with some outlining the research questions they would ask. Examples of past students' replies are given below:

Just looking at the first one, 'large businesses tend to be more efficient than small businesses'. My first question would be why, where is the background knowledge, what other things have they got to back that up, are there any references, are there any statistics? When they say 'tend to be' would that mean a 60/40% split or a 90/10%, and what is the split between them? How/to what effect is it more efficient? What scale are they measuring it on? They would be the sorts of things that spring to mind. (Past student, Interview 1)

I would choose the second one. I would do a hell of a lot of research into motivation and performance levels and obviously use journals and periodicals, as many academic sources as possible. I would use Emerald, LexisNexis, and EBSCO and use the E-library to a certain extent. (Past student, Interview 1)

I can't remember how we do it from Critical Thinking but I would go about it by doing the research on motivation and then just performance related pay [chose Statement 2]. I'd find examples of whether organisations actually... some people are motivated by money and just get examples. (Past student, Interview 1)

I'll do this one: 'Large businesses tend to be more efficient than small businesses'. Who has said that? Where has it come from? When was it written? Has it come from a large corporation because they want to make it look like large businesses are more efficient? Is there any truth to it? Which is almost impossible to answer, I would think. I would be inclined not to accept that as a sentence or a statement. There are so many businesses so it is hard to decide which one is more efficient, who defines a large business and who defines a small business. (Past student, Interview 1)

In contrast, there was much less depth to responses received from current students and they needed more prompting from the interviewer:

With what [the tutor] taught us to look at, it [Statement 2] is basically saying the way to motivate is through money, so people motivate through money and if you offer them more money then you would get a better performance. You could say that this could be true if that person's perspective on the world is money and talk about everything related to that. The other argument is that maybe money isn't the only thing that motivates people, that they do reap a job satisfaction. They do it for social rewards, things like that.

(Current student, Interview 1)

I will choose 'the most effective way to get people more motivated in this business is to offer more money for better performance'. It means that everyone just wants money in a job and there are lots of people out there that don't want a job just for money, it is just more about what they experience in their job. I think it is more about creating an environment that can motivate people themselves.

If you were going to write an essay on that how would you go about your research, what would you do to find out if that statement is valid? How would you create an argument?

I would see what people think in theories or research on motivating people and see both side of it for example those that support it and those that don't and just compare.

(Current student, Interview 1)

I would look at the sales figures and things like that for this one in terms of efficiency, the wastage, what they produce and how good they are with the social stuff.

If you were going to write a piece of work on that where would you start with your literature search?

Mainly journals; there are BTEC books on it as well and there should be quite a few.

The majority of students felt that the Critical Thinking module had been very important for helping them to validate such statements. This extract illustrates how the module has impacted on students' learning:

> It was just through small little questions that [the tutor] would give us. We looked at different parts of the argument and developed an argument; assumptions, people's perceptions on the world, how it was written out. You had to identify the argument as it could be just a statement so if [the tutor] had said 'money motivates people' [they are] just stating that as a fact and it's not actually an argument. (Current student, Interview 1)

Students also commented that they were taught to search on all sides of an argument, not to just believe something, to look at it from another perspective and be critical:

> *In taking the Critical Thinking module how did you learn that that is the way to answer that question?*
>
> We read through statements like that and [the tutor] would ask us what came to our mind and would develop what we would say and [the tutor] would prompt us more.
>
> *Do you think if you hadn't done the module it would be a lot harder to answer the question? Have you been able to answer it so well because you are in Level 3?*
>
> I think you would be able to do it if you hadn't done the Critical Thinking, well you should be able to, but doing the Critical Thinking would perhaps back up your knowledge more and you would feel more confident that what you were doing was right.
>
> (Past student, Interview 1)
>
> It really gets you to dig deep and ask questions such as 'Why would it be more efficient? Why would somebody have said that?' If you keep asking 'Why? Why? Why?' all over again you start to get down into the important information that would have caused somebody to come up with that sentence... ...If you keep using it without thinking about it you naturally start to become more critical with things.
>
> (Past student, Interview 1)

The tutor gets the audience involved and encourages active participation which makes the sessions more interesting and encourages learning. Students commented that the method of lecturing was a major contributing factor in their learning how to think critically. For example:

> [The tutor] is almost relentless; [the tutor] doesn't give in to a simple answer. [The tutor] gets you to think and explain why you have said something whether it is agreeing with the sentence, why you are agreeing with it, if you are opposing it, why you are opposing it, where you get a conclusion from and how it creates an argument. (Past student, Interview 1)

However, another (Level 3) student commented that their knowledge was not just from taking the Critical Thinking module but was as much as result of their general learning experiences across all modules:

I don't think it was just to do with Critical Thinking. From Level 2 to Level 3 is obviously a big step and from the experiences of Year One and Year Two you just know how to do it. I don't think that just doing the Critical Thinking module will make me know how to do an essay. (Past student, Interview 1)

5.3.3   Students' transference of learning within Business

Both current and past Critical Thinking students commented that the module had specifically helped them with their academic work in other modules. For example:

What definitely helped with the academic side of it was using reliable sources because what [the tutor] taught you was to look at academic sources to make sure that they are reliable and also to look that the argument is sound logic. I think that is where I went wrong in some of the coursework. I got a reliable resource but then I think [the tutor] said that even though it was an academic resource it doesn't sound logical, what they were actually saying. That will help me because I'm doing a case study right now. I should be able to use that.

(Current student, Interview 1)

Has what you learnt on that module affected the ways in which you approach your work on other modules?

Yes.

That sounded a very definite answer. In what ways?

I don't know whether it was just how [the tutor] taught it or the material itself but you learnt not to just use any website or books or text or references, you have to make sure it's from the right places and written by the right people. [The tutor] had a big thing about not using the wrong kind of sources. Now I would double check everything before I put it in so that I know it is a credible resource.

(Past student, Interview 1)

I thought it would be more business orientated where as it was more academic. It is easily transferable to use in a business situation but I found it more useful with other modules e.g. with academic work, researching, that kind of thing.

(Past student, Interview 1)

It opens your eyes a bit more. You don't read a source and take it for granted; you don't necessarily believe what is written in front of you. You start looking at where it is from, when it was written, why this person might have said it in this way, have they got any agendas politically, or any biased-ness? You don't just find a source, put it in an essay and think I will use that for one side of an argument. You can actually get into it and understand why they have said that and if it is actually useful and appropriate for what you want to do with what you are writing.

(Past student, Interview 1)

The current student quoted above also commented that, although they had got a low mark in the module, they found it extremely beneficial as coursework was their weak point and the concepts that they had learnt in taking the module would help them to direct their coursework in other modules.

Current and past students reported that taking the module had helped them to look at assignments in different ways – they break up the question and research the different aspects of it. One past student reported that taking the module had given them the confidence to 'go off on my own and start other assignments by myself'. Prior to taking the module they had waited to start until they had seen the ways that other students were going with their assignments.

However, there were contrasting viewpoints. One current student was unsure as to whether the module would help in other modules:

> *So you think it will have an effect on your academic writing then as well as your researching?*
>
> Definitely but at the same time what I do think is that maybe I still do quite a good standard of course work without the Critical Thinking module that is why I am slightly skeptical. I don't really know yet and I can't really evaluate how valuable the information I learnt is.
>
> (Current student, Interview 1)

Another past student reported that the module had not affected their approach to their work – they had changed their approach to their work in Level 3 but felt that this was as much from learning by their mistakes and a response to a demand for a higher level of work.

Negative responses to the module were, however, minimal. In the main, last years Critical Thinking students, now in Level 3, reported that the module had had a beneficial effect on how they approached their researching and writing in an academic context and that it had been an essential tool for 'backing up their thinking'. Current students were also complimentary about the module but were more likely to report that as yet they had been unable to apply the concepts/skills taught – partly because their assessments so far had been mostly exam-based and it was difficult to apply the concepts they had learnt because their exams to date were based on multiple choice questions. Past students, presented with more essay-based questions, found it easier to apply the concepts learned in the module.

Students were asked whether other modules specifically assessed them on the types of things taught in the Critical Thinking module. The majority of students reported that they do and that generally Business modules are asking for the same kind of things. However, students reported that the Critical Thinking module was not referenced by tutors on other modules. In addition, students felt that it is not always obvious what other module tutors were looking for:

> [Other modules assess you on] some parts of Critical Thinking definitely, especially the evidence and the resources that you have used. I am not sure if they evaluate the logic of the argument and the quotations that you put in your essays. That is where I am unsure if there was any point in doing the module. It is not clearly stated that you have got to look at this evidence critically; the lecturers who set you the coursework don't actually say that to you.
> (Current student, Interview 1)

Students did, however, report that they get higher marks for more critical evidence they put in their Business assignments, although tutors do not generally touch on the more critical aspects as much as other aspects. As one past student commented:

> They don't touch on as much on the critical aspects of it such as where it's from and why did someone do it. I suppose it is there between the lines but they don't say it in black and white. (Past student, Interview 1)

Although the module is presented to students as a being there to help them with other modules within their Business degree, and is constantly reinforced as such throughout the module by the module tutor, other tutors within Business do not generally refer to the module in this way (as reported by students). From the students perspective their modules within Business are not linked but are presented to them in isolation. The only time that the Critical Thinking module is mentioned is in the Level 3 Research Methods module. The Research Methods module website also has links to a critical thinking website set up by the Critical Thinking module leader.

5.3.4 Students' perceptions of research-informed teaching within Business

The Business School places quite a heavy emphasis on teaching students about research. However, this is more about researching secondary sources and how to understand research papers than about actively doing the research themselves. Students are not taught research methods until later in their degree and these are only very basic (students undertake a very small research project requiring a very small sample size and limited analysis).

Students reported that what they were being taught was relevant to the research being undertaken in the wider discipline. Lecturers did sometimes discuss their own research in class and students found that this helped them to understand the value of research. One student felt that it is particularly important to be taught by lecturers who are actively involved in research: They state:

> It helps more because they know what they are talking about more than if somebody had just read about it and then tried to teach it. It is more practical. It does help, yes.
>
> *Do you lecturers actually bring in their own research to the lecturers? Do they discuss it in the lecturers?*
>
> Something like in one module we have got a lecturer who has worked in the industry, so every time they try and explain something they refer to an example of what they did in their business that they were working in, and it does really, really help when they give examples.
>
> (Current student, Follow-up interview)

Students were able to see the value in research and felt that it is an essential part of their degree. Below are some examples of how students interviewed at follow-up, who were in the final stages of their degree, saw the value of research:

> Because it [research] can give you more points of view towards an argument or question that you may be answering.
>
> *Do you think that the development of research techniques is essential for your degree?*

I believe it to be, yes. I don't know what degree but it is definitely important and I have noticed that since I have done my research methods there has been an increase in the quality of my references.

(Current student, Follow-up Interview)

It [research] is really to gain some knowledge and then learning more about how you interpret information that you get.

In what ways has it linked to your dissertation?

It is more of the critical analysis of the literature review mainly because we have done a little bit in research methods and now we have to just broaden it more in the project.

(Current student, Follow-up Interview)

I would say it was important. It is a way of increasing your knowledge I think, and different ways of giving you an idea of what other people see it [the literature] as and how you perceive it. (Current student, Follow-up Interview)

All students who were asked questions about research reported that they felt they had a relatively good understanding of most research processes but some were less confident about the statistical aspects. Students would have liked more tutorials in this area. Some students would have also have liked to have run more active research projects because they enjoyed it and felt it was of benefit for their knowledge of the discipline in general. The following quotes illustrates why:

It does help to know how to tackle the process [of research]. It tells you from the beginning this is the question you have to devise, then you have to find ways of asking people to find answers. It does help research... ...It is good in the way that it shows you what to do and so if you needed to get some primary research you will know how to carry it out, and then blend it in with your secondary [research]. (Current student, Follow-up Interview)

5.4 Psychology Project Module – Psychology[8]

5.4.1 Students' experiences of the Psychology Project module

All Psychology Project students were fully aware of the aims and objectives of taking the module (which they reported were explained well in the project handbook) and most reported that it was much what they expected it to be when it was presented to them at the end of Level 2. There was one student who expected more guidance as to which area to base their research in:

First of all I thought it was the dissertation and I thought it was going to be a big portfolio and it was going to be so many thousand words and I was like 'Oh, my God'. I was interested in doing it because I thought it was a chance for me to show I can write fluently but I didn't

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[8] No second interviews were run for students from the Psychology Project module. Furthermore, only current students were interviewed because was not possible to track students after they had left the University.

expect to have to go off on my own and not have much guidance. There are certain areas that I would like to do but they would only show you a certain amount of areas in the module and I had to think of something on my own. I thought they would give us an area that we could go and research. (Current student)

Other students enjoyed the fact that they were allowed to choose their own project area and methodology. For example:

One of the things I love most about it is that it is my research and, although my supervisor is there helping and guiding, it is still where I want to take it and it is the thing that I am specifically interested in. Nobody said that you have to do it in this particular area or you have to use this particular method so it has really been left up to me and I love that part of it. (Current student)

Another student said felt it was not made clear enough at the end of Level 2 that it was important to start on their project early:

It seemed a bit early to start it [at the end of Level 2] but [there was] not enough push to get into it. I think I got to the point where I rushed into picking the topic which I wanted to do because I didn't really understand the importance of it at the end of the second year. I thought we wouldn't decide until the third year. I don't think it was fully explained. (Current student)

All but one student interviewed believed that taking the module is important for a degree in Psychology and were fully aware of what the module was trying to achieve in terms of giving them more opportunity for independent learning and challenging their abilities. It was important to some students that they take the module in order to get BPS accreditation for their degree. One student said it was important because research is what psychologists 'do':

It is more because that is what psychologists do, they research. If you don't know how to research you can't be a psychologist in a sense, can you? (Current student)

There was one student who felt that doing the Psychology Project was not necessarily essential for the resolution of their degree and felt that the time could have been spent in more productive ways:

Do you think that doing the dissertation is important for a degree in Psychology?

From my own point of view I would say no.

Why is that?

Well we have been asked to do research before where we have done research methods modules and been asked to conduct studies and present data, and do what we are doing in the dissertation but on a slightly smaller scale. I think it doesn't actually employ any different skills than we have already used like essay writing and data collection. It has been done before. I can understand why they say to do it, as you need to demonstrate that you have actually learnt something, but I'm not totally convinced it is the best way.

Have you any ideas on what would be the best way?

That is an interesting question. I don't know. I suppose I would like to see more practical training on what we are supposed to be doing rather than just theoretical which is what we do most of the time.

So practical training in terms of practical workshops within the university or do you mean going out and putting what you have learnt into practice?

Both, even if they are only controlled scenarios where you are asked to use what you have learnt. To a large degree we are not.

(Current student)

All can be seen from this extract, students had prior experience of the types of skills they were being asked to utilise in their project. These skills were gleaned mostly via Research Methods modules taught at each level of their degree programme, although the skills/processes were presented in much less depth. The main difference appears to be that ethical considerations have been bought into play for the Psychology Project.

The major difficulty experienced by students in undertaking their research project was difficulties recruiting participants and there were complaints that the voucher system, employed to get other students involved as research participants, was ineffective because students from other levels still chose not to participate. Students felt that the importance of the system should be pushed more with Level 1 and Level 2 students. Many students underestimated the amount of work that would be involved in the project and commented that the intensive work involved had had a detrimental effect on the time they had available to dedicate to other modules.

Students experienced differences in supervisory practices, with some students being set deadlines for the various stages of the project, and others being allowed to set their own pace. The following extracts illustrate the differences in supervisory practices/expectations:

I know how other people's tutors say that they should do a certain thing by a certain date. With my tutor personally [they are] a lot more relaxed. [The tutor] says basically as long as we understand it then that is okay... ...[They say] as long as I understand it and I get so many done by such a date then if there are any problems we can talk through it. [The tutor] hasn't really set me any proper goals like 'Have this done for this date so that I can check it over?' (Current student)

I must admit for the sessions where I have seen [the tutor] for tutorials it has been me setting the agenda. I have a meeting and [they ask] what I want to discuss rather than [them] saying what [they want] to talk about. (Current student)

The tutor I have has been very good and lets me know the deadlines. I tend to run over them because I am quite bad with deadlines. I am fairly happy with the criteria that [the tutor] has done and the way [they want] us to do it and the help that [they have] offered. [The tutor] has been very good to be honest. My project has come together much better than I imagined it would at the start. (Current student)

To take on board what they say. To have regular meetings and keep them posted on where you are up to. Keep on target for your rough draft because you get the chance for your tutor to see your Project once and then that is it. I think they expect you to keep to a rough draft deadline and don't expect to see it three days before the actual deadline. (Current student)

> It was more self-led than I thought it was going to be. You go in and [the tutor] would fill in the form of what [they] wanted you to do for the following week but I felt like I had to sort more stuff than I would have to. I suppose that is all part of the dissertation though. (Current student)

> It was very much left up to me within our project group. There were four of us within our supervision sessions. Our supervisor was very much 'This is your degree so it is your project; you do it how you want to do it'. [The tutor] did set guidelines of when [they] expected drafts to be in. Although you could miss that if you really wanted to [they] said ideally by Christmas we should have done your introduction and then by the end of January we would have completed the next bit etc. The guidelines are there but there are grey areas. (Current student)

> I knew that I would have some guidance off my supervisor that would help me go through everything, but at the moment I think I am being left on my own to do it. I have got to motivate myself because I have heard that other people, my friends, have got deadlines for their first draft. I haven't got anything like that and I'm thinking that I am spending too much time on one aspect. (Current student)

Some Psychology Project students reported experiencing difficulties getting support/feedback because of a change in supervisor due to the supervisor being ill or them taking a career break. Students taking the Sport and Exercise Psychology award experienced ambiguous expectations about the structure of their project because their project supervisor was based in a different department. There are also reported differences in students' levels of organisation – these seem to be related to how early students started work on their project, however – some students started in the summer between Level 2 and Level 3, some had left it until well into the start of Level 3.

The one Graduate Diploma student interviewed felt that diploma students in general were less informed than undergraduate degree students. Although diploma students were grouped with degree students for lectures their award was structured differently with a later start date and a later completion date for the Psychology Project. The diploma student felt that this led to them receiving less information and more ambiguous deadlines. He also discussed not knowing that his proposed supervisor was leaving until very late in the day. He felt that the Psychology Project tended 'to be a bit adhoc from the Graduate Diploma point of view'.

In general, the majority of students understood the assessment procedures in terms of what it took to get a good grade for the project – they were outlined in the project handbook. Despite this, however, there were students that felt it was still hard to know what was required and who would have appreciated a little more guidance and less vague criteria: 'some kind of difference between what makes a 2:2 and a 2:1', for example. One student reported that the criteria were sometimes hard to understand:

> Yes it gives you little bits of information but it is all worded in university speak. I know by the third year you really should know but it sometimes goes over your head. I can't understand most of it. (Current student)

Differences in how students understood the assessment requirements seemed to be related to the amount of support/expectations they received from their supervisor. As one student commented when asked what their tutor expected from them:

> Just keep on track. It's been made quite clear that if I am struggling with anything I shouldn't just sit and think about it I must go and ask somebody rather than letting it get too late. Ask loads of questions. Keep up-to-date with everything, set little goals, little timescales. (Current student)

5.4.2 Students' understanding of the development of knowledge within Psychology

Psychology Project students were presented with a number of questions designed to assess their understanding of the development on knowledge within Psychology. Initially students were presented with two hypothetical statements (supplied by the module leader):

(1) 'Large studies tell us more about the human mind than small studies';
(2) 'Experimental/quantitative research in psychology is better than qualitative research'.

Students were then asked how someone in Psychology would go about checking the validity of one or other of the statements. One student gave a very involved response as can be seen from the following extract:

> I will pick the second one, qualitative versus quantitative but I have no idea how I would actually ascertain which side of it was true because I am very much of the viewpoint that they are both equally valid under different circumstances.
>
> *If you were going to create an argument on that basis how would you go about doing that?*
>
> I would probably look for a particular area of research say, for example, memory and see if there was any qualitative research or quantitative research on it and then compare the two of them. Then I would find another area, maybe attitudes, and look at qualitative versus quantitative so for that you would have attitude scales versus semi structured interviews maybe. I would just see the depth of information that you get back. It really does depend on the question you are asking I think, personally.
>
> *Why do you say that?*
>
> Well, for example, my dissertation is about how people construct an attitude and I don't think you are going to get that kind of answer from an attitude scale. You could find out what their attitudes are but you are pigeon-holing them into agreeing on a scale from one to ten. Whereas I want to find out where it has come from, why they thought that and if they can actually back up their argument; you can't get that from an attitude scale.
>
> *If you were going to do a literature search for that where would you start?*
>
> Debates in Psychology, I think, because there are plenty of journal articles out there already. I would probably start looking at that and get a better idea of the actual view points that purely quantitative research has taken and see what their reasons are for preferring those methods and then take it from there.
>
> (Current student)

In contrast to the above student, the remaining students gave shorter, less involved, answers – students were able to outline where they would go to look for information and how they would conduct research in the area but few verbalised the research questions implicit in either of the statements. For example:

> I would probably go into E-journals, journal articles and literature reviews and then see if there is anything (quantitative and qualitative) in particular that is arguing for one or the other or looking at a particular area and then see if there have been any critical evaluation. (Current student)

> I would go and look for articles that are based around that [Statement 2], published articles. I think the starting point might be looking through text books which can prompt you to look at certain articles. Then when you read articles these point to other articles. Also by looking through literature searches, getting articles and pulling them down. It is really getting a feel for it and seeing what is published... ...I would be looking to present a balanced argument for a start.... (Current student)

> I'm going to choose the top one, 'Large studies tell us more about the human mind than small studies'. I think basically you'd do a small pilot study and then a large normal study and compare the effect size. Then you would try and go through cross cultural studies and see if it is generally applicable. You would try and include a variant of participants i.e. male/female, different races, different ages, and try and generalise... ...I'd look for supporting statements and also statements that argue against it and I would see how valid those statements are and then put them both on a piece of paper and do a conclusion to it. (Current student)

> I would probably look at previous research [referring to both statements]; go for books but journals as well especially more recent journals. People have gone to books and thought they would elaborate on it and gone to journals. Journals are very, very useful especially the most recent because obviously it shows you the most recent data. I would probably also do a pilot study to double check what they did and find out what confounded variables hindered the experiment and the conclusions. I would definitely look for other research and see if anyone else has done the same and elaborate on that. (Current student)

When students were asked how they had learnt to validate these types of statements *all* students said that their learning had been a consequence of taking other modules on their degree. This is not surprising considering that students were very close to completion of their degree. The following extracts illustrate the general vein of the responses:

> Research Methods again, Dealing with Differences, Exploring Psychology, loads of them. It is basically what the degree is about... ...they all touch on it to some extent. (Current student)

> I think it's a build up of knowledge over the years of my degree. (Current student)

> It is not just from the dissertation it is from before. With essays when you are looking at two things you always compare and contrast. I wouldn't really know what qualitative is unless I had done research methods. (Current student)

One student did say that their work on the Psychology Project had extended their research knowledge to some extent:

> I would say a lot of it [learning how to validate such statements] comes from before we did the project because we have had to develop the skills we need to do the project already as we are being taught skills as we go along.

Could you say that there is anything new that you have learnt whilst you have been doing your project?

Yes, which is related to the questionnaires that I am doing, it is scales and measurement. I have never used those before. I knew of them but I have never actually done one based solely around questionnaires rather than experimentation. Trying to lure participants has also been quite interesting.

(Current student)

5.4.3 Students' transference of learning within Psychology

Generally, students felt that taking the Psychology Project had not particularly affected how they approached their academic researching and writing because the module is presented too late in their degree – it was more a case of other modules having an effect on how students approached their work on their project. For example:

I have a particular way that I like to approach writing essays or literature reviews. I have taken the skills from what I have already done into my project to write my introduction and things like this. It is actually being applied the other way; I am using skills that I have acquired before to do the project rather than transferring it the other way. *(Current student)*

Not really because I think our Project is set quite late on in the degree programme. There might have been a few things. I don't think I really learnt anything significant in this module because we had already been prepared for it. (Current student)

One student reported that taking the Psychology Project (and Psychology in general) had affected how they looked at things in the English component of their joint Psychology/English award:

I think I have noticed it today in one of the [English] seminars that I had. Most of the group I am working with are all coming in from an English way of thinking. They don't look at it psychologically; they don't look for depth and look from different angles. I noticed that after the group that I was working with had spoken about their points of view. I gave a completely different perspective coming in from a different angle. It completely undermined what they were saying but in effect it was still backing up what they were saying. It was really weird how it happened. (Current student)

Working on the Psychology project appeared to affect the time students had to dedicate to other modules. Students perceived that the project was the most important:

I would like to say no [the project has not affected work on other modules] but I think it has because the project is the main focus all the time… …I am not really paying attention to my other modules. I will turn up and I will do the work but I am not putting as much thought into it because in the back of my mind I keep telling myself that the dissertation is more important… …I think I need to concentrate on that more. (Current student)

I wouldn't say the learning has. I have to admit I feel less inclined to do my other modules because I am so engrossed in my dissertation but learning wise I don't think it has changed anything at all. I approach the dissertation the way I would approach all my other modules. (Current student)

Some students also felt that, although it is not explicitly communicated as such, some tutors feel that the Psychology Project is more important than other modules. This left students confused as to whether or not they were *supposed* to see the Psychology project as the most important.

One module in particular could be having a detrimental effect on project work – a number of students reported that 'Dealing With Difference', presented at the beginning of Semester 2, had raised questions for them as to how they were working on their project. Students would have liked the module to be presented earlier in the year. The following extracts indicate students' confusion:

> 'Dealing with Difference' that is the one that seems to have shattered things a bit at the moment. I suppose we have got to look at all aspects and look at the critical side of psychology as well but I think while you are writing a research project you are trying to concentrate on writing it but at the same time you are going to these lectures that are telling me that statistics aren't very good. (Current student)

> From the module [Dealing with Difference] I feel like all the psychology I have learnt is basically flawed and it has really confused me. I think 'Well how do you do it then?'… … I do really enjoy the module but I wish it was maybe in the first or second year then that would have helped me to look at everything critically. At the moment I am struggling to look at different things critically… … It [the Psychology Project] is just a small little project that probably needs expanding on a lot more because of what that module [Dealing with Difference] has told me, i.e. this is flawed and that is flawed and I think 'Oh my God, I am going to fail this, it's going to be absolutely ruined now.' (Current student)

In the main, students felt that the criteria for assessments across all the modules in Psychology were consistent and assessed students on their ability to perform the same set of basic processes. For example:

> Usually in essays we have to give a balanced argument and we can't just do it from one point of view… …so the whole time you have got a study in front of you and you are encouraged to look at it closely and say 'Firstly, what are the problems with it?', 'What other evidence is there to support it?' and 'What is the evidence that doesn't?' Then look closely at why they have found what they have found and why somebody else has found something different… …If you didn't create any kind of argument or pick the study apart then I think you have failed miserably. (Current student)

> ….the reports have to flow, and the research has to be up-to-date, and you have to have answered the question, and you have to make a conclusion, so it is a similar format in that sense. It is just the introduction that is not. (Current student)

However, there were reports that the criterion for the project was less clear than for that of other modules:

> *Do you actually know what the tutor's expectations of you are in terms of achieving a good mark? Do you know how they want you to proceed?*

> With my modules and what I am being assessed on yes. They give me the criteria to go from and then they say you are expected to do X, Y and Z. With the project I am not really sure what is expected of me. I know I am supposed to possibly conduct a study, have expectations of what I want to find, to conduct a study and find out what I have got and just write it up. I

don't know anything else except that and that is from doing a basic research methods module. You look at a study, you have expectations i.e. your hypothesis, what you want to find. You then do your study and establish what you have found and if it is opposite. Then draw up conclusions and maybe what you can do in the future and that is it. I haven't had any other criteria to go from.

(Current student)

The criteria for the project I don't think has been handed down as well as it could have done but I am working on the basis that they are looking for similar things that they would do for a normal Research Methods report. This is just more in depth because we are Level 3 and not first years any more. They are expecting a much better finished project. I am assuming it is much the same level. They are always geared towards the same thing. (Current student)

Generally the Psychology Project is presented in isolation from other modules except Research Methods modules to some extent. Tutors are likely to refer to assessment dates relative to that of the project but the project is not generally referenced by tutors in any other context or linked to other modules. Students did say, however, that all tutors on their degree programme constantly reiterate that they should be looking at *all* their work from 'multiple perspectives'. Although there does not appear to be any formal links between modules on the Psychology degree programme it is implicit that students link what they have learnt on the various modules wherever relevant.

5.5 Evidence Based Practice in Nursing Module – Health Professions[9]

5.5.1 Students' experiences of the Evidence Based Practice in Nursing module

All students interviewed on the Evidence Based Practice in Nursing (EBP) module seemed to accurately understand the objectives of the module and reported that it fulfilled their expectations. This can be seen from the following quotes:

It is to get you thinking about what you are actually putting into practice and making sure it is evidence based and what you should be using, or whether there is something better out there. (Interview 1)

It is just mainly for us to choose what to use in practice because nursing you can't use anything that isn't evidence based in practice, because if you try and do something that isn't proven and it backfires then you are in a lot of trouble. So you have to know where to look and if it is any good... Just that sort of thing really, and then apply it. (Interview 1)

Well everything we do in practice is evidence based so we have got to know how to look at a piece of research and say whether it is good or not because that is what our work is based on. (Interview 1)

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[9] All students interviewed for the Evidence Based Practice in Nursing module were current students (from the 2008/2009 academic year). Interviews were conducted on two occasions, at the beginning and end of the module. Therefore student quotes will only be referenced as being from Interview 1 or Interview 2.

The only other thing really is checking the validity of the research. Someone could say it but it doesn't mean that it is right. You are just checking that what you are doing is right by [researching] lots of different people's views on it. (Interview 2)

One student reported it being even more than what they expected:

I thought it would be about different scenarios in nursing, where the evidence came from to do with them and things, how they have been proved to be successful and everything.

Is that what you have actually found so far?

A little bit but it has been more about how to analyse and critique evidence and articles that have been produced in research.

(Interview 1)

The majority of students felt that taking the module was important for a degree programme within the Health Professions and for wider practice. This is not surprising as students reported having been given a good grounding for understanding what evidence based practice is; in the first year of their studies the concept had been discussed, especially in terms of why it is important for practice. Students had also been advised that they would be taking the EBP module in their second year. The following quotes illustrate why students saw the module as being important:

Because you wouldn't want to think you are doing something and it went out of date twenty years ago. (Interview 1)

For most placements it will just be that you can check what you are doing or what your mentor is doing is still up-to-date, but there might be some more specific things when you get there. (Interview 1)

When I got there [on the placement] I read through their procedures and it made me look at them and think 'Well, are they actually doing it right?' You can just take a step back and look at it as a bigger picture. (Interview 1)

I think it is just to be able to think a bit more about what you are actually doing when you are at work because otherwise you do all the theory at university but then the actual practical side is completely different. It is quite good to marry the two together. (Interview 1)

I think it is [important for degree], yes, because you don't just research things to do with evidence based practice it is research on everything. Like the application of nursing we are doing, we have got to research things to do with anatomy and physiology and look back at what people have found. It goes across all of the modules doing that. (Interview 1)

I think that it is important [for their degree] but I think it is more towards the academic side so I think we are all finding it harder because there is a lot of research to be done and reading. It is all about looking at things and analyzing it which it what we have got to do. (Interview 1)

There were two students, however, who found it difficult to understand how the module would be related to their wider degree:

The type of things that you are being taught, how do you see this fitting in with your degree as a whole?

I really don't know. I know there are research nurses but that is all we have really been told. We haven't been told whether we have to do any when we have qualified or anything like that, or any research, in this much depth.

What about fitting it in with the rest of your degree, can you see where it fits into that? Can you see what purpose it is?

Not really, not to me personally.

(Interview 1)

Now the types of things that you are doing in the module, being taught how to critique research that kind of thing, do you think that it is important to take this module for your degree?

I don't know if we should have had an assignment in it. I don't think it is that relevant. I am glad we have had lectures in it but I think it is quite hard and I don't see the relevance all the time in it.

In what ways don't you see the relevance?

Just some of the things that we have to do, we have to critique it and it seems just a lot harder and I don't see the point.

(Interview 1)

Some students experienced initial difficulties understanding the critical nature of the module, i.e. critically appraising qualitative and quantitative research. There was a critical appraisal assessment and students were worried about completing this. The following quotes describe the difficulties some students experienced with the assessment:

One or two of my friends have found it a bit complicated at first to grasp the idea and to get the data together and how they are supposed to cross reference and things like that. They have struggled a bit but as it has gone on they seem to have got the hang of it better. After we have all talked about it that has straightened things out a bit I think.

(Interview 1)

I thought to start off with I was really struggling but it is just catching up with me now, it is starting to make sense, it is like a snowball effect sort of thing but a few of my friends are struggling with it at the moment. It is a hard thing to get your head around.

In what ways, do you think?

Because a lot of people are just used to reading an article and thinking 'Yes, that is right' but now we are being told 'No, it is not necessarily perfect, you have got to pull it to bits and this should be in it and that should be in it'. There is a lot of bias and things like that. It is a new thing to get your head around so things that are new to you are hard to begin with.

So do you think some people are having problems grasping the concept that you have got to criticise it?

I know some of my friends are yes.

(Interview 1)

The first of the quotes above also illustrates the importance of group reflection for understanding what is required. This can also be seen in the following quote:

> When we have done group work we have got one piece of research that we have all looked at, and there are about eight or nine of us and we had all got different opinions on it, and we were all saying what we thought, and somebody else was saying 'I haven't looked at it like that, I thought it was this'. So it really did tell us how you see it is just your way of seeing it. It is not wrong or right. If you can put down what you see and back it up with evidence from the research then that is fine. I think it is good when you have got different opinions because you can see different sides of things.

It was reported that every effort had been made by tutors to help students master the concept of critical appraisal. Tutors run a system in which students self-report where they are on a picture of an oak tree (i.e. an acorn, the sapling, the tree, a bigger tree, etc). This way they monitor which students need more targeted help. Students find that this system works very well. Students also found the CASP critical appraisal tool (see Pages 29-30) was useful for helping guide their appraisals:

> *Have you been given something to use, the CASP tool, have you used that and did you find it of benefit?*
>
> Yes definitely. It was easier for me. It was ten questions and all you do is answer the question which is much easier than trying to pick it out of my head.
>
> (Interview 1)
>
> Half of it [the assignment] is about critical appraisal and half of it is about nursing values. That is what we have got to do, pull the article to bits. I'm going to use the CASP system just because it is easily laid out to be honest. (Interview 1)
>
> The critical appraisal part wasn't too bad actually because I just used the Critical Appraisal Skills Programme (CASP). They have loads of different questions that are laid out. Say, if it is a qualitative piece of research you get that tool off the internet and then go through questions. They ask 'Has it got a clear aim?' 'Yes'. Then you go onto the next question. You just work your way through and then at the end you know if it is decent research or not. I just use two forms off that to evaluate that bit. (Interview 2)

Undertaking the critical appraisal was for some students beneficial for helping them to understand the wider practice. For example:

> I think doing the assignment has helped me in that way [with understanding practice]. We have got a piece of research that we have got to look at and we have got to critique it, basically. I have found it really hard and everybody else has as well. This is the hardest assignment we have ever had to do and everyone has been pulling their hair out with it. I think by doing it, it does make you realise that you can't just look at a piece of research and think 'Oh yes that's good because a certain person has wrote it'. If you really pick at it and look at it there is loads of stuff you can see that is not very good. Some things are good too. It has helped me in that way. I think I won't ever look at a piece of research again and just think 'Yes, that's fine'. I will look more deeply into it. (Interview 2)

However, in contrast, another student felt that it had not been adequately explained *why* the critical appraisal element of the module was relevant for the practical aspects of nursing:

I don't understand how it is relevant. They haven't really explained to us how it is relevant. [The tutor] said people don't want to be nursed by someone who can't critically appraise a piece of literature. That to me doesn't make sense, they are not going to come up to you and say 'Excuse me, can you analyse this and then you can inject me'. I don't really understand the point of it but that is just me. I don't really get it. Maybe it is because I don't enjoy that sort of work. I don't enjoy it, I don't see the point, but it hasn't been explained either... ...I know you have got to do a degree of academic stuff and do all the assignments and things. I understand why you do an assignment on the other stuff like the nursing values but I don't understand why you have got to critically appraise something to be a good nurse. That is the bit I am struggling with. (Interview 1)

Difficulties with the values-based section of the assignment were also reported. This was in part because the lectures were so broken up because of the scheduling of work placements. Students felt that an additional lecture on this aspect of the module may have been useful. They would also have liked more information on where to find references in this area. Finding references was a particularly difficult aspect of this assignment. Students also suggested that providing them with examples of assignments would have also been helpful.

Modules in the Health Professions awards are set up so that they all assess students on the same kinds of processes. However, one student reported only having been given limited information about the assessment criteria for the assignments, not just for the EBP module but for other modules:

What have you been given about the marks that they are looking for and the standard that they are looking for? What have you been told so far?

They just say that it has to be brought up to Level 2 which, I have been told, is not really a discussion it is more like analytically you have got to say that this person says this and this person agrees, or this person disagrees. You have got to make your own judgment of that.

Have you been given any learning outcomes or anything like that with the assessment?

No I don't think so.

The different stages as to how you get to the Level 2 standard, for instance?

I have not been given anything like that, not that I know of.

Is it like that in any module or just the EBP?

I think I had it once last year but I don't think I have had anything since.

(Interview 1)

In contrast, other students reported that at the beginning of each module they are given a run through of the assignment and the marking criteria. Both of these are freely and easily accessible on Blackboard. There seemed to be a distinct lack of motivation to look for marking criteria, however, and also a lack of motivation to use it in some instances, which might partly be related to a lack of information about Blackboard in general. For example:

What about your actual assessments and the grading, have you been given any information on that? What they are actually looking for and what you can do for each grade?

I think you can get it on the internet, I am not very good with the whole Blackboard thing. I think you can find how they grade it and what grades there are and what they are looking for.

Will you be using that to help you to write it?

I don't usually no. I just try and get something.

So you have not looked for any guidance?

No.

But it is there if you want to use it.

Yes, it is there but I don't know how to access it. It is on the Blackboard but I find it really confusing.

Have you thought to go and see anyone about how to access it?

No.

(Interview 1)

Students reported that they can easily get help, advice and feedback if they need it. There are no systematic faculty mechanisms set up for this but they only need to email the appropriate tutor. Students have reported that replies to emails are in some instances quite prolonged and there were some complaints that a number of tutors were on annual leave just prior to an assignment hand-in date and this made getting advice problematic. Feedback for draft and final assignments was reported as being very good. However, because the EBP module is so spread out, with a work placement in between, students would like revision sessions closer to the assignment hand-in dates.

5.5.2   Students' understanding of the development of knowledge within the Health Professions

Evidence Based Practice in Nursing students were presented with a number of questions designed to assess their understanding of the development of knowledge within the Health Professions. Initially students were presented with two hypothetical statements (supplied by the module leader):

(1)   'Nurse led service delivery is of special value to patient care';
(2)   'Maintaining older people in their own homes is associated with improved recovery times after treatment'.

Students were then asked how someone in the Health Professions would go about checking the validity of one or other of the statements. One student gave a general reply which applied to both statements:

> Well you would find out who said it and see what their background was. You would look at the research, look into it and see if they had asked two people or how many. You would also look around the area so you would see if there is any other research and what their outcomes were or if they had got a completely different response.   (Interview 1)

Examples of other replies are:

I suppose, with the older people statement, I would look at research with patients with certain conditions that have been nursed in the community and in hospital and compare statistics on recovery rates and mortality rates to see how they compare. I can't think of anything else.

What if you were going to write an essay on that? How would you go about it? What would you do?

I would probably try and narrow it down to a certain condition because that would make it easier to look for research as it is quite broad as it is.

(Interview 1)

I would find research looking at the recovery times after treatment and see what they found so far and maybe do research with older people and ask them what they wanted and things.

What about the types of research questions you would ask, would you formulate any research questions as examples or anything like that?

Yes probably but I don't know exactly what I would do.

Where would you go to look at the research?

The internet, books or maybe journals and things.

(Interview 1)

I will go for the nurse led one: 'Nurse led services delivery is of special value to patient care'. I don't exactly know where to start to be honest. It is the big thing at the moment. ...I would look for nurse led services that are up and running already to see if they have had any research done or not, see if that has been validated. ...The obvious way would be 'for and against'. For the 'for' you would find research about how nurses spend more time with patients and then find the references for that and the training and how it would be gone. The 'against' would probably be about the length of training of doctors and things like that. I would probably end up making it more like an argument between nurses and doctors as that is the only way I can think of doing it. (Stuart Hall, Interview 1)

It depends what was said. Is it old people in general or old people mental health? Do they have a specific problem? If they had a specific problem then you would go and research that and then probably look for some statistics and things, about old people who are kept in their homes like for recovery and see if it does improve, what the research has shown and recovery times after treatment. You could see if there are any different recovery rates for people that are in hospital or for people that are in their homes. From that I would branch out and branch out but it is not planned, it is something I think, it just comes to me. (Georgia Hemingway, Interview 1)

Students reported that taking the EBP module has been very important for helping them to validate statements in this way. For example, the EBP module teaches:

Just don't take everything at face value because you can have a piece of research that is ten pages long and is shortened to three paragraphs. When you read the three paragraphs it sounds great but if you read through and dig a bit deeper it is not always right. Things can be twisted a little bit to suit. (Interview 1)

There is a marked lack of depth in students' replies to these statements, however. Students outlined where they would search for their information and mention key words but only one student discusses the research argument or research questions implicit within such statements:

> The first one: 'Nurse led service delivery is of special value to patient care'. I would definitely look at nurse led services and the outcomes, if they were good or bad. I would look at patient and public involvement websites and their opinions on nurse led services and obviously nursing values comes into that as well. ...I would think 'Are nurse led services a good thing?' 'What can they bring to patient care?' 'What values have nurses got in comparison to doctors?' If you [the patient] had been seen by a nurse. I would look at that sort of thing. (Interview 1)

This lack of depth in replies is somewhat surprising given that a large component of the EBP module is teaching students critical appraisal skills. When asked specifically what the term 'critical thinking', 'critical reasoning' or 'critical appraisal' means, the majority of students were able to explain what the concept is:

> Weighing up all the factors... And then making an educated decision. (Interview 2)

> To me you would think not looking at it straight on and accepting what it shows you but to look at it from different angles and different views, so just taking a broader view of it. (Interview 2)

> Is it when you look at a piece of evidence or an article and you go through it and you find things that are good about it and things that are bad about it, what could be improved, what could be done differently, things like that. (Interview 1)

> It's about coming to some kind of judgment about something by looking at all the criticisms of it to see if it is any good or not. (Interview 2)

> To look at something, break it down and look at it in more depth and things. (Interview 2)

The quality of these replies does not seem to be evident in students' answers to the 'development of knowledge' statements, however, but there are conflicting reports as to whether students been taught how to critically unpick various aspects of a statement, or pull out key words; some said they had been taught this skill, and some said they had not. One student (at Interview 2) was unable to describe what the term 'critical thinking' meant at all and suggests that they have not been taught this concept. In our discussion with the module leader he reported that initially tutors do not use pedagogical terms such as 'enquiry' or 'critical thinking' in the early stages of the module. This may be reflected in the student's comments that they have not been taught the concept of critical thinking. It would be expected that by the end of the module students are familiar with the term, however.

5.5.3   Students' transference of learning within the Health Professions

In the main, when interviewed at the beginning of the module, students felt that what they were learning on the EBP module would be beneficial for their work on other modules. For example:

> Yes [it will be useful] because you do a lot of research and if you are using that then you can actually go through it and critically appraise it, and find out if it is actually worth putting in. It is quite useful. (Interview 1)

> Yes we have definitely recapped on what I already knew. When I am reading the Nursing Times now, which is one of the magazines we have to read, it helps me read because I can

relate to the studies more. Things in every day life, like adverts and things like that, I can see that they are not always true. (Interview 1)

I suppose they could. Whichever degree that you do, you have to critique anything that you are given because you have to cross analyse and use lots of different data to try and come to some kind of opinion to carry on afterwards. (Interview 1)

Just being able to look at research and know if it is good or not because we have got to look at research for all of the modules really. (Interview 1)

One student even felt that the concepts learnt could be transferred to other awards:

Do you think that the things you have been taught will be transferable to other degrees?

Yes. I think it is quite a broad subject. Some of it is not relevant to nursing. I think it is not 100% relevant to nursing and I think it could be used for other subjects.

(Interview 1)

When interviewed at the end of the module these students were able to report that concepts learned throughout the EBP module had indeed been transferable to other modules, although opportunities to do so had been limited because they had not had any assignments, only exams. The following quote illustrates how learning could be transferred over into practice:

Can you use what you have learnt in other modules?

Mostly you do, yes. You have to relate everything to practice, everything you do at university obviously in some way you might have to use in practice. You have to have some evidence base behind it to use it in practice.

(Interview 2)

There was, however, one student who felt at the second interview that the EBP module had not helped:

Have you been able to use any of the techniques that you have learnt in EBP for other modules, for example, how to do critical analysis?

No. If it is supposed to I don't know but for me it hasn't. I haven't really analysed anything because just looking at a piece of boring literature just screams boring. It is something that I wouldn't really try to do anyway but I haven't been able to use it off the top of my head or anything.

(Interview 2)

Modules in Health awards are set up so that they all assess students on the same kinds of processes and students reported that their learning can be transferred across modules because all the modules are linked together:

Do you think that what you have learnt in the EBP module you have been able to use in other modules?

Yes because it all links together.

What sort of ways?

The evidence based practice links in with your clinical skills because that is obviously linked together and then you have got your professional nursing so that is linked in with your research and looking into different ways of doing things.

(Interview 2)

Reports were conflicting as to whether lectures from other modules actively make reference to the EBP module. Some students said that lectures did actively link the EBP module and other modules on their award. Other students suggested, however, that the links between modules are more implicit, rather than explicit, and that students are often left to formulate the links for themselves. One student reported:

Apart from in another modules where he [the tutor] links directly to the anatomy and physiology module that we did last term, where that is quite heavily linked, there are other things that you can relate together in your head but they are not directly stated so much... ...I don't think they make it really obvious. They don't say 'Oh, this can be linked to this module'. They always say 'In practice you know this will happen'. It is not so much interconnected between modules that you are studying at the time.   (Interview 1)

Another student reported:

So do lecturers in other modules make reference to the EBP module at all?

Well evidence based practice is the golden word in most things to be honest because you can't do anything without having it.

So you find that the EBP module is linked to your others?

I don't know if the module is linked so much but the concept of it is.

(Interview 2)

Whether the links between the EBP and other modules are implicit or explicit, the consensus of opinion is that all modules on Health Profession awards are linked together.

5.5.4   Students' perceptions of research-informed teaching within the Health Professions

The Health Professions Department puts quite a heavy emphasis on teaching students to do research. In the words of one student:

Yes they do talk a lot about research, all the modules do, they say that you need to research this and look at that. They do put an emphasis on it. I think it is a good thing. When you are out there as a nurse and if you say 'We should be doing it this way', someone is going to say 'Why?' You have got to be able to back up your argument. You have got to have the confidence to be able to say things and change things if you want because you have done the research and know what you are talking about. You are not just saying it because you think it is okay.   (Interview 2)

This student felt that developing research techniques are an essential part of their award. This was a feeling held by most of the EBP students interviewed. However, not all students were of the same opinion:

> I think we do need to know that everything that we do is evidence based but it is not actually the nurses that do the research so I don't know whether... it is a debatable thing isn't it. (Interview 1)

Students reported that they can see the connections between what they are taught in the EBP module and the wider research area. Some of the lecturers on the EBP and other Health modules discuss their own research in their teaching. Students felt that this helped with their own understanding of research:

> ...you think research is this big thing but if you see someone who you know normally doing it then it brings it down a bit and makes it more accessible. (Interview 2)

> Yes, I think it is [can help] because they can explain things better because they have done it themselves. (Interview 2)

> It does help a lot when tutors and lecturers draw from their own experience and use stories or research that they have done themselves because it draws your attention rather than them just telling you about someone else's research. (Interview 2)

Students were asked specifically about what research is, and what the value of doing it is. Some replies are illustrated below:

> It is to make sure that things you do in practice are worthwhile doing, that it is safe to do and for the best interest of the patient.
>
> *So you feel there is a value for doing it?*
>
> Oh yes, definitely.
>
> (Hayley Barker, Interview 2)
>
> For a better knowledge base of areas. (Interview 2)
>
> To get a better idea about something or to find out what people want or where things can be improved. (Interview 2)

Students understanding of the research process varied, with students reporting quite limited understanding ('5' on a scale of 1 to 10), and more extensive understanding, i.e.:

> Yes [I understand] more than I did before I started this module, definitely. If somebody says research you just think 'Oh yes, someone is going out and finding statistics about things'. I definitely thought that if that piece of research was there and it had been published I thought that is good. I definitely thought like that. Now I don't. (Interview 2)

The majority of students interviewed on the EBP module thought that learning to do research is worthwhile for their degree. However, students had not been involved in any research projects; either for the module or the wider award (although some had run research projects for their Psychology A level). A number of students felt that active

research involvement might have improved their understanding of the research process. For example:

Do you think that it would help you to actually do any research projects and learn anything about research methods?

Maybe, a brief thing; if it was brief and it showed you how hard it is to make a good, sound piece of evidence because there are a lot of factors that you can fall down on. If you fall down on one then people won't even look at it and see it as a decent piece of evidence. I suppose if it is a short part of the course, maybe like a month, just something quick but not something too intense. Just as an eye-opener.

Interview 2)

I think it would [help] because it is a bit more interactive and interesting if you are doing stuff and it is something that you have got your own hypothesis that you want to prove instead of looking at something that someone else has done. It is better if it is more relevant. …I think it would help more later on when you have got jobs and you have to look at things on your placement that you are in charge of; like if you are finding out whether what you are doing is actually beneficial to anyone. (Interview 2)

Yes I do [think it would help] because you would be able to look at where you went wrong and what things were right. You could look at someone else's [research] and compare to see if it is quite common that that usually goes wrong or something. (Interview 2)

Probably yes [it would have improved understanding], if you are actually going out and doing some [research]. I think it is quite hard though, from looking into it I think it is a hard thing to do, to actually go out and research something and be valid as well. That is a hard thing to do. (Interview 2)

There was only one student who felt that active involvement in research would not have helped with their understanding, but they suggested that this could be because they were not interested in that aspect of Nursing.

5.6   Criminology Module – Law [10]

5.6.1   Students' experiences of the Criminology module

The Criminology module is a cross-disciplinary module based within the Law school. Students taking the module are on single honours Law awards (either Law or Criminology)[11] or on combined Forensics/Criminology or Psychology/Criminology awards. All students therefore have some degree of Law training in their award. The module is also a combined Level 2/Level 3 module with single honours Law and Criminology students taking the

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[10] All students interviewed were current students therefore interviews will be referenced as Interview 1 or Interview 2. A selection of Level 2 and Level 3 students were interviewed therefore the relevant level of the student will be referenced in the quotes.

[11] Note that the Law School runs both a Criminology award and a Criminology module. Therefore to avoid confusing these, in the text (including quotes) Law and Criminology single honours awards will both be discussed as 'Law' awards.

module in Level 3 and combined Forensics/Criminology or Psychology/Criminology students taking the module in Level 2. Students interviewed reflected a cross-section of these awards/academic levels[12].

On the whole, all Criminology students interviewed were able to explain what the module is trying to achieve. All students expected the module to be about issues around crime but expectations of the content for the module varied somewhat. For example:

> I think the aim really is to get us understanding the effect the criminal culture has on society as a whole and the community, and just give us a basic level so we can build on to it next semester and onwards. ...I expected a lot more statistics than what we have had so far, a lot more...   (Psychology/Criminology award, Level 2, Interview 1)

> [I thought it was] about the criminal system and why criminals act the way they do and the theories behind it. It is not so much the psychology of criminals, though, but more about the criminal justice system.   (Criminology award, Level 3, Interview 1)

> To gain an insight into why crime happens. ...It is interesting to look at how different theories have evolved and what each person's perception of crime is and where it has originated from. (Law award, Level 3, Interview 1)

> I expected, basically, to be going into the minds of criminals and it would be mainly about that. Obviously when I came into it, it was more criminal law based. (Forensics/Criminology award, Level 2, Interview 1)

Some of the students reported being a little unsatisfied with the how the module had progressed. One student felt that it was rushed and too much information was presented in too short a time. Another felt that the module diversified into the social areas of crime too much, citing discussion of 'feminism' as one specific example. Another student, when interviewed at the beginning of the module, questioned how the module fits with their other Law modules. By the second interview these links had become clearer for them, however.

The majority of students felt that taking the Criminology module was important for their degree. However, this was more because the module was consistent with the structure of their awards, and relevant for future careers or intended post-graduate study, rather than because the research skills they learned were useful for other modules. One student reported that taking the module was important because it gave them an idea of future jobs. Students did acknowledge that learning research skills is important for their awards, however. For example:

> *Do you think taking these types of modules, the research skills element; do you think that is important for every subject across the university?*

> Yes, I don't think you can go primarily off what the lecture teaches you or the confirmation in your tutorial; you do have to go beyond it. The lecturer only gives you the foundation and it is

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[12] Student quotes will include the award the student was taking and their academic level. Note 'Criminology' in the quote references refers to the Criminology award rather than the Criminology module.

about expanding on that. Otherwise you are not going to get the desired marks in your course work. Even though the lectures can be really thorough you still have to go beyond it to develop your own opinions on things so that you can offer those up.

(Law award, Level 3, Interview 1)

Students found it relatively easy to understand the content of the module. However, some students experienced difficulties with the amount of reading, stating that there was more reading than in any of their other modules. This extra reading seemed to be especially problematic for Law students:

In Criminology there is not one right answer and it involves a lot of reading to get different perspectives and then to just form your own opinion based on different perspectives, or not even forming an opinion at all. One person has this theory whereas another person has that theory. I can see the valid points in both. In Law it is just one way. (Law award, Level 3, Interview 1)

A number of students reported being unsure of what was required for the research project assignment. This may be partly related to a mix-up with room scheduling which meant that some students missed the session on the assignment. There were also differences in how students from different disciplines reacted to the assignment; straight Law students tended to find it more difficult. The following quote from a Law student illustrates this point:

Yes there is a difference [in how students approach their work]. The legal people tend to panic more because we are not used to the way the books are written or we have got a research project – what the hells a research project? I am used to writing essays so I am a bit panicky about that. There is a difference because you are so used to... Law is a 'yes' and 'no' topic. It is very factual; there is a right or wrong [answer]. Whereas this [the Criminology module] is more opinion based and what you think and how you interpret it. So it is harder.   (Criminology award, Level 3, Interview 1)

All Law students interviewed did well on the Criminology module research project (getting 1^{sts} or 2:1s). However, they felt that they would have liked some additional help, possibly with the research project being explained earlier on in the module to give them more time to work out where to go with it. Criteria for the assignment were outlined in the handbook but students reported that this was sometimes difficult to understand. For example:

It [the assessment criteria] was in the module handbook. It was not referred to as such but they did say you can see it in the handbook, but none of the teaching staff have gone through it. It is a case of it is there, refer to it, but I don't.

So there is nothing that has helped you to evaluate what to do with it?

I think what the problem with the structure of them is that it is so vague. I know even with my Law ones, and they are quite similar, even the higher levels where they have got the description of how to get that kind of mark; it still makes it sound as if the piece of work is rubbish. There is so much negativity on it whereas it will be 'A good answer but lacking in...' You can't really gain a sense of what they are looking for.

(Law award, Level 3, Interview 2)

Some students felt that the hypothetical nature of the research project (i.e. designing a project and critiquing its design rather than carrying it out) was problematic. One Law student stated:

> You don't actually carry it out so you had to think. It was hard to try and think what I would actually use and how to conduct the research because you don't actually have to physically do anything apart from think about what you would do, and say whether that would be good or bad and how you would change things if you did it again.
>
> *If you had actually gone out and done the research yourself would it have been easier?*
>
> Yes I think if the assignment had been just to do a proposal and you just had to say what you would do then yes, but you had to analyse how you thought the outcome would be and it was like 'I don't know because I haven't done it'.
>
> (Law award, Level 3, Interview 2)

Despite the problems, students did feel that they got some benefit out of doing the research project. The following extract illustrates this:

> I think it was really interesting going on self study. You do learn in lectures but then you progress on your own. It has made me understand everything more.
>
> *Was that learning how to carry out research?*
>
> Yes it was about if you did carry out a questionnaire, what would you do? …and about knowing how much effort gets put into finding out about statistics. It is actually quite daunting. If people don't answer truthfully then you are not getting the correct information… and the whole process of finding who to target to interview and whether to target everyone. Also there are negatives of doing that, i.e. it is time consuming and the money element. It is really quite interesting what goes on behind all of the statistics that you see in books.
>
> (Forensics/Criminology award, Level 2, Interview 2)

There were conflicting reports about the students' levels of satisfaction with the feedback provided on the assignment; some students were very happy with the level of feedback and help they received, but others were not. One student said that they had plenty of good points on their assignment feedback but would have preferred to have had the bad points so they could see exactly where they were going wrong. Another would have liked more advice generally:

> …it was like the front sheet with my course work, it said 'Excellent research on Neighbourhood Watch; lacks fluency in areas, contradicts themselves in areas', but that was it on the front sheet. It doesn't tell me where I have done it or how I could have improved it. I think maybe just a bit of one-to-one should you want to go over your course work would be good. The top sheets are just so vague and you can't gain an insight into where you have gone wrong. (Law award, Level 3, Interview 2)

Getting hold of tutors was for some students problematic; a number of students were unhappy with the lack of response or delayed response to emails, and there were complaints that not all tutors knew what the research project assignment entailed and were therefore unable to advise effectively on it.

5.6.2   Students' understanding of the development of knowledge within Law

Criminology students were presented with a number of questions designed to assess their understanding of the development of knowledge within their respective discipline. Initially students were presented with two hypothetical statements (supplied by the module leader):

(1)   'Many criminological theories say that crime is based on defective social regulation and that people deviate because society is so flawed';

(2)   'Criminology is an eclectic mix of theories which has drawn from a range of other disciplines'.

Students were then asked how someone in their respective discipline would go about checking the validity of one or other of the statements. The most in depth response came from a student on a joint Forensics/Criminology award. This student discussed the research argument and outlined the research questions they would ask. They reported that their learning how to validate such statements as those given was not just from the Criminology module but as much from their other Law modules. These points are demonstrated in their reply:

> I think I would go with the second one. Well you want to know what kind of theories you would pick and what disciplines so you can answer that. You can't just say disciplines because someone will say 'What is the discipline?' I probably would ask the question 'Is it a major contributor of one theory or is it a gathering of many that makes it balanced?' 'Is it one that stands out more than the others?' I would probably just talk about that to make it understandable of how criminology is a mixture of stuff...
>
> ...I think it is a bit of both [from Criminology and from other modules]. The Criminology and Criminal Law from the previous year I have had a different understanding of how to actually tackle a question whereas before I didn't know how to do that in general. Certainly seeing it from a Law side [i.e. their Criminology award] I think that has been the most influence. Forensics is more data and practical work so it is a little bit different.
>
> (Forensics/Criminology award, Level 2, Interview 2)

The single honours Law students (of which there were three) gave responses of much less depth than the above student when asked to validate one of the statements. Comparing these to the answers above it can be seen that these students did not discuss the research argument/questions, although they did discuss examining the links between the various theories. These replies can be seen below. The first of these would be considered as more in-depth than the other two as the student discusses making links across different disciplines. This student also discusses how they have learnt to validate statements in this way:

> I'll choose the bottom one. I would first of all describe what Criminology was and the area of Criminology, maybe do a little bit of history but then I would go onto the theories because there are three schools, I think, and describe the theories and how they relate to Criminology and how Criminology is developed through them. I suppose within that you would link the theories as to whether they apply to other areas, maybe Psychology or even Law itself and how that is worked within the theory and how much that relates to Criminology if at all.
>
> *So have you learnt how to answer that from taking the Criminology module?*

I would say it [learning how to validate statements] is from Law because the way we are taught in Law is to break down the question. As you have probably noticed I have gone through and touched the paper and different words. It is because you are told to pull the question apart to figure out what it is actually asking you. I would take each part of the question and answer... ...We don't really get asked these kinds of questions in tutorial for Criminology [module] whereas I would for Law.

(Criminology award, Level 3, Interview 2)

For the first statement 'Criminology law theories say that crime is based on defective social regulation' I would identify what is meant by defective social regulation. Then I'd review different perspectives on people's reactions to the defective social regulation if there is one. I would try and see the links there. I would see if there is a link between crime and that.

(Law award, Level 3, Interview 2)

I would probably pick the first. You would go into whether that was what criminological theory said. It would be looking at how truthful that is. You could either take the stance of saying that that is correct or you could do a half and half. I think I would probably do a half and half to see whether actual theories did suggest that crime is based on defective social regulation.

So when you say 'half and half'...?

It would be originally just seeing whether it does say that and if it doesn't... well you could take it two ways. If it did say that it was then you could critique it saying that you didn't agree with it, or if it suggests that that isn't the way then you can offer obviously another side to things.

(Law award, Level 3, Interview 2)

The first of these quotes comes from a student who reported that their Law modules have been beneficial for helping them to unpick research statements. The second comes from a student who reported that their learning comes from the Criminology module generally but that their Law modules have also helped. In contrast, however, the third quote comes from a student who reported that their learning comes from what they learnt at school initially. They suggested that the Criminology module has had little impact because it was a skill that they already had in place. This is not reflected in their responses to the validation question, however. If this skill was already in place, we would have expected a much more involved response. This student was also unable to explain what 'critical thinking/critical reasoning was:

If I said the term 'critical thinking' to you or 'critical reasoning', what would those terms mean to you?

I have not done it in my Law degree. I would probably say no, I don't think so. It doesn't feel as if I know about them.

Do you understand what I mean when I say 'critical thinking'?

I think I know what you mean. I do know but I can't describe it to you.

(Law award, Level 3, Interview 2)

Other students, in contrast, gave good descriptions of the concept. For example:

I would call it to critically analyse, to go through it and do the positives and negatives and why I have said for each. It may not even come to a definite conclusion at the end. (Law award, Level 3, Interview 2)

Well you would have to look at the good and the bad and criticise whether it is working or not working, and what is making it work or not making it work. (Forensics/Criminology award, Level 2, Interview 2)

...making sure that research has validity and if it doesn't, pull it apart. (Psychology/Criminology award, Level 2, Interview 2)

The three remaining validation responses come from two Forensic/Criminology award students and one Psychology/Criminology award student. The depth of these responses is commensurate with the last two quotes given above. None of these students discuss the research argument or research questions inherent in the statements and none discuss linking theories across disciplines. One of the Forensics/Criminology students states that their learning how to validate these statements comes both from modules on their Criminology (i.e. Law) award as well as from their Criminology module. The other felt that their learning was from what they were taught at school but not from their modules at the University. The Psychology/ Criminology student suggested that their learning was from their Psychology module as much as from the Criminology module.

5.6.3 Students' transference of learning within Law

The majority of students felt at the first interview that the Criminology module would be beneficial for their work on other modules and academic researching and writing in general. Some of their replies are given below:

I think my performance in tutorials is better especially with Criminal Justice and Criminology [module] because we have kind of done the same, especially for Criminal Justice, we have just done about data and how data is recorded and then that was picked up on in Criminology. It wasn't in my notes but when the tutor was asking us questions I was able to reflect on what I had done in Criminology and use it for Criminal Justice. (Criminology award, Level 3, Interview 1)

The subjects that they teach are very interesting so it makes you want to go and research even more anyway which only helps when you come to do something else. You think 'Oh yes I remember doing about that' so they do connect and they do make you think about other things. Even the forensic side of things I will think 'Oh yes I did something about that in criminology', then I will go back to my criminology notes. (Forensics/Criminology award, Level 2, Interview 1)

I think Criminology [module] , from having no right or wrong answers [compared to other Law modules] but always having to look at the different possibility, has helped me to broaden my thinking and broaden my perspective on things. That is always useful. (Law award, Level 3, Interview 2)

The following Interview 1 and Interview 2 quotes from a Forensics/Criminology award student are particularly good for demonstrating how the module is beneficial over time:

In some of the Forensic stuff we talk about certain cases but Criminology [award] has already covered it or, like last year, Criminal Law; having to do that is like a stepping stone into

Criminology [discipline]. We learnt about famous cases and how to apply the law which will probably help me within Criminology [award] in general. It is now answering questions like 'Why do people do it?' not 'What do they get punished for?' It is like 'Why?' and 'What have they done?' It is a greater understanding so it covers all areas really. (Interview 1)

Yes [it has helped] especially with the social science part of the Criminology [award]. This year I applied the same style of assignment towards my Forensics ones and I got the same high grade just because I now understand how to do structure and stuff. (Interview 2)

(Forensics/Criminology award, Level 2)

There were two students, however, who felt that what they had learned on the Criminology module had not been transferable to other awards.

I guess that Criminology [module] and Crime, Justice and Punishment kind of cross over a little bit but apart from that no because it is more that the research methods modules have helped with the Criminology [module]. They have crossed over that way but not the other way. (Psychology/Criminology award, Level 2, Interview 1)

Not particularly. I think it has got me thinking about different things. I have found elements of it quite interesting but more for me personally. I can't really apply it to anything else. It is just more that I have learnt something new. (Law award, Level 3, Interview 2)

The Psychology/Criminology student also felt that transference of learning was the other way round; what they had learned on other modules on their award (specifically their research methods) was transferrable to the Criminology module. Differences in whether or not students felt their learning was transferrable were not dependent on the award that students were taking.

The Criminology module is not formally linked with other modules on Law, Forensics, or Psychology awards. Students reported that lecturers in other modules do not generally refer to the Criminology module. It is sometimes mentioned by lecturers on other Law modules but this is not consistent. The module leader reported that linking the Criminology modules with other modules was difficult because of the cross-disciplinary nature of the module. Students did, however, report that modules *within* their various disciplines are linked, and some students suggested that if the modules were linked in some way *across* disciplines then it might help with their studies. Students do formulate the links themselves and most felt able to transfer their learning across modules. Students reported that it is implicit in all their modules that they formulate links within and across disciplines. However, a Forensics/Criminology student felt that it would be of little benefit for modules to link formally and that it is up to the student to do that themselves:

Do you think you would have any benefit if they [the modules] did link?

No not really because you are learning two separate things. You are learning why and how from different sources. You put the two together yourself at the end... ...They do say 'Go away and read'. They don't say 'This is it; this is all you need to know'. They do say 'You need to learn even more outside' to connect the two.

(Forensics/Criminology award, Level 2, Interview 2)

All modules on awards within Law, Forensics and Psychology are generally assessing ability to perform the same kinds of processes as examined in the Criminology module and give similar marking criteria. As discussed previously, however, some of the straight Law modules have not previously required some a high level of critical thinking skills and this has been difficult for some students to address.

5.6.4 Students' perceptions of research-informed teaching within Law

Reports were conflicting as to what kind of emphasis is placed on teaching students research in the various awards. One Law student reported that her award places a heavy emphasis on research:

> Quite heavily [place an emphasis on teaching research]. In your essays if you haven't got an extensive bibliography you lose marks so really you don't have any choice but to read a lot of sources. It is like for your tutorials, if you haven't read something and it is critical to the tutorial work you just know that you should have read it because you can't really answer the questions. You need to do that. There is a big emphasis on research.   (Law award, Level 3, Interview 2)

Other students suggested that there is no emphasis on doing research. This is surprising considering that Law, Forensics and Psychology awards are all quite research intensive, although students on straight Law awards are not required to run active research projects, in contrast to Forensics and Psychology students. Students did report, however, that it is constantly being reiterated that they must find the most up-to-date information.

All students felt that knowing how to research is an essential part of their award and are generally able to connect the content of their awards with the wider research in the discipline. One student described why they felt it is important:

> *Do you think that learning how to do research is an essential part of your award?*
>
> Yes definitely. It is essential for Criminology [module]. It is kind of a research module. Even for my other modules it is essential… …Just the discipline of having to do extensive research is good for my Law modules too and helping me to develop that discipline and that commitment to actually put the work in.
>
> (Law award, Level 3, Interview 2)

However, students sometimes struggle developing connections with wider research because of the cross-disciplinary nature of joint honours Law awards. For example:

> *Do you find that you connect the content of your award with the wider research in the discipline?*
>
> Yes, but because we are split, sometimes the relevance is aimed at full Forensics [students] but for Criminology [award students] it is aimed at us. We feel like we understand a bit more on one side but feel like we struggle on the Forensic side because we haven't done chemistry.
>
> (Forensics/Criminology award, Level 2, Interview 2)

Students reported that lecturers on awards in Law and Forensics modules do occasionally discuss their own research in their teaching, but that this is not a regular occurrence. In contrast, lecturers in Psychology modules discuss their own research more regularly. Students suggested that these more personal illustrations helped them to better understand and identify with the concepts being taught.

Students were asked specifically about what research is, and what the value of doing it is. All students understood quite well what it means to 'do research'. Students' perceptions did not vary across different disciplines. Some replies are illustrated below:

> I suppose to get different people's opinions and values on things and to see what the general consensus is and whether, if a research project has been put in place, it is working and if not why not. Also how it can be improved. (Criminology award, Level 3, Interview 2)

> For me research is just to expand on things. Lectures will cover the primary points of things but that is just very basic and gives you the background of a topic. Without the research you can't see the full picture. You have to research further into it to fill in all of the gaps that you will find from the handouts which will be full of gaps so you need to read and see what other people have said about it. If you had got a question on it then you can say 'Oh yes I read this and this is what they said'. It just helps to give a fuller answer. (Law, Level 3, Interview 2)

> Well for criminology getting different perspectives I suppose, a deeper understanding of the subject and the different theories I think. (Law award, Level 3, Interview 2)

> Constructing an argument I suppose and testing other people's theories and seeing what can be done to create a better argument I suppose. (Psychology/Criminology award, Level 2, Interview 2)

> Well it is to learn, to find out what is actually going on. Unless you research what is going on in a society you don't know what is going on. By actually going to people and speaking to them face to face you can find out. It is all right reading a book, this is what happens but does it still happen. Unless you actually go out and research the information, how do you know? (Forensics/Criminology award, Level 2, Interview 2)

> I think there is only so much that you can learn in a lecture so if something interests you going out and researching it can keep you motivated. Also for later in life the people when they employ you they try and focus on maybe your third year project so you need research in that area in order to stand out from the other applicants and to get a better knowledge of what you're studying. If you need to know diseases, if you study diseases you aren't going to be stumped when someone asks you a question. (Forensics/Criminology award, Level 2, Interview 2)

> I would say to gain a wider knowledge of a particular topic or what you are currently doing. In Forensics for example if you are studying tool marks, you are going to want to know what other tools are out there for example and what surfaces they can make a mark on. (Forensics/Criminology award, Level 2, Interview 2)

Students understanding of the research process varied, however. Students on straight Law awards were less confident in their research understanding than other students. One student felt that their understanding was bad but had achieved a good result in their assignment; they suggested that they 'must have subconsciously understood what I was doing'. Law awards, including the single honours Criminology award, do not require students to actively run research projects and this may have been reflected in their lower understanding of research techniques. On the other hand, Psychology awards involve

students actively running research projects and both Psychology/Criminology students were relatively confident in their research abilities and understanding. Both also felt that it might have helped none-Psychology students' understanding if they were taught more about research and research methods. One Psychology/Criminology student described the differences between the amount of research taught in Psychology and Law disciplines:

> *Do you think that you have been taught enough research in your degree?*
>
> Definitely in Psychology.
>
> *What about in Law?*
>
> I felt sorry for those who didn't do Psychology in Law especially doing Neighbourhood Watch [the Criminology module research project]. It isn't hard. It is common sense but with regards to testing the hypothesis and all of that I think they will have found that really difficult.
>
> *Okay so you think from that perspective it would help Law students if there was more research involved?*
>
> For them, yes.
>
> (Psychology/Criminology award, Level 2, Interview 2)

For Law students, their experience with the Criminology module research project was a negative one because they had not done any of this type of research before. Law students' research tends to be more about researching secondary sources rather than running their own research projects, or having any research methods teaching. One of the Law students did agree that more active research might help them to understand research processes. They described why they thought this:

> Yes, because you can get on and get real answers rather than 'They could say this' or 'They might say this'. You actually have what people say to you. (Criminology award, Level 3, Interview 2)

6 Quantitative Analysis

This section presents the results from the quantitative data collection. We first present some descriptive data. We next discuss whether there are any differences between different subject modules in critical thinking abilities and epistemological beliefs, followed by an analysis of the relationship between critical thinking/epistemology. We then examine whether there are any changes in students' critical thinking abilities and epistemological beliefs over the period of the study, i.e. from the beginning to the end of the modules in question. Finally, we look at the relationship between academic performance and critical thinking/epistemological beliefs. Note that in order to avoid confusing the Critical Thinking in Management module with the critical thinking abilities test, module subjects will be referred to using the department they belong to rather than the module name (e.g. 'Business' will be used instead of 'Critical Thinking in Management', and 'Geography' will be used instead of 'Project Planning and Preparation').

6.1 Descriptive Results for Critical Thinking and Epistemological Belief Scores

Table 5 shows the means and standard deviations for all students that provided critical thinking and epistemological beliefs scores at Time 1 and Time 2. These are summarised as below.

Table 5 Descriptive statistics (means and standard deviations) for critical thinking and epistemological beliefs scores at Time 1 and Time 2 (Time 2 in parentheses)

Module	Number participants	Critical thinking		Epistemological beliefs	
		Mean	SD	Mean	SD
Sociology: Current	39 (36)	2.967 (2.669)	1.664 (1.488)	19.000 (19.800)	4.760 (4.310)
Sociology: Past	31 (n/a)	2.625 (n/a)	1.752 (n/a)	21.767 (n/a)	4.797 (n/a)
Geography	30 (28)	3.253 (3.046)	1.436 (1.765)	22.100 (21.889)	3.872 (3.724)
Business	107 (63)	2.683 (2.562)	1.710 (1.907)	25.877 (26.066)	4.200 (4.366)
Psychology	139 (87)	3.131 (3.146)	1.571 (1.448)	20.336 (20.747)	3.780 (3.974)
Health	39 (26)	2.961 (3.235)	1.278 (1.428)	20.385 (21.000)	4.450 (3.544)
Law	43 (26)	3.071 (2.969)	1.675 (1.325)	21.615 (19.840)	4.246 (5.406)
Overall group	428 (266)	2.955 (2.924)	1.610 (1.602)	21.981 (21.961)	4.756 (4.790)

Critical thinking. For Time 1 and Time 2 the overall critical thinking mean was 2.955 and 2.924 respectively. Standardised critical thinking scores ranged from -.556 to 8.556 at Time 1, and from -1.45 to 7.630 at Time 2. For both times, therefore, the mean was relatively low on the scale. Time 1 critical thinking means for individual modules ranged from 2.683 (for Business) to 3.253 (Geography). Time 2 critical thinking means for individual modules ranged from 2.562 (Business) to 3.235 (Health).

Epistemological beliefs. For Time 1 and Time 2 the overall epistemological beliefs mean was 21.891 and 21.961. These scores were out of a possible 40. The higher the score on the scale the less sophisticated were students' epistemological beliefs. The epistemological

beliefs mean scores for Time 1 for individual modules ranged from 19.000 (Sociology: Current) to 25.877 (Business). Time 2 epistemological beliefs means for individual modules ranged from 19.800 (Sociology: Current) to 26.066 (Business).

6.2 Differences between Subject Disciplines in Critical Thinking and Epistemological Beliefs

The pattern of means indicates that there are differences between subject modules in levels of critical thinking and epistemological beliefs. Using Time 1 data (N = 428) a one-way between-groups Analysis of Variance was conducted to explore whether the differences between modules were statistically significant. There were no statistically significant module differences for critical thinking ability ($F(6,421) = 1.214$, $p = .298$, $\eta^2 = .005$) but there were significant differences between modules in epistemological beliefs ($F(6,409) = 23.106$, $p = .000$, $\eta^2 = .253$). Post-hoc comparisons (using Tukey HSD) indicated differences between Business and all other modules (all significant at $p = .000$) suggesting that Business students had less sophisticated epistemological beliefs (i.e. were less tentative, or more definite, about their knowledge beliefs) than students from other modules. Differences were also found between Sociology: Current and Geography students ($p = .040$) with Sociology students having the more sophisticated epistemological beliefs.

6.3 The Relationship between Critical Thinking Ability and Epistemological Beliefs

6.3.1 All subjects

Multiple regression was used to determine whether there was a relationship between overall critical thinking ability and students' epistemological beliefs for Time 1 students (N = 428). We used overall critical thinking score as the dependent variable and epistemological beliefs as the independent variable. In our estimates we also included gender, subject module (Law, Business, Health, Psychology, Geography, Sociology: Current students and Sociology: Past), average GCSE grade for mathematics and English, and whether the student went to school outside the UK (and therefore did not have the option of taking GCSE qualifications). Definitions of the variables are given in Appendix 9. The results are presented in Table 6.

In presenting our results we consider a student who is female, has a mid range GCSE score[13] and is taking a law (i.e. Criminology) module. In interpreting the regression for overall critical thinking ability and overall epistemological beliefs (Table 1, Section A) the significant variables (all at 1%) were gender, low GCSE and going to school outside the UK (with no GCSE option). Being male increases the probability of getting a high critical thinking score, whilst both low GCSE and going to school outside the UK, and therefore not having the option of taking a GCSE qualification, decrease the probability of getting a high critical thinking score. There was no relationship between overall critical thinking ability and overall

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[13] Equivalent to an aggregate score of performance at GCSE mathematics and English of 3, 4 or 5, given that A*=4, A=3, B=2, C=1, below C=0.

epistemological beliefs. Neither were there any significant relationships between critical thinking ability and subject module.

Table 6   Regression results for the relationship between critical thinking ability and epistemological beliefs (using Time 1 data, N = 428).

Variable	A. Critical thinking: overall[a]		B. Critical thinking: analysis[b]		C. Critical thinking: evaluation[c]		D. Critical thinking: inference[d]	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
Male	.485*	.012	.022	.538	.056	.104	.059*	.044
Sociology: Current	-.064	.868	-.019	.794	-.032	.646	.001	.991
Sociology: Past	-.289	.476	.022	.774	-.030	.684	-.047	.445
Geography	-.034	.935	.046	.551	-.115	.127	.006	.925
Business	-.087	.791	.096	.131	-.011	.854	-.046	.374
Psychology	.116	.701	.042	.465	.013	.808	-.021	.650
Health	.035	.926	-.003	.962	.003	.962	.027	.642
High GCSE	.314	.428	.033	.653	.083	.241	.027	.645
Low GCSE	-.604*	.001	-.007	.846	-.046	.168	-.100*	.000
School outside UK	-1.216*	.001	-.223*	.001	-.129*	.050	-.085	.122
Epistemology								
Overall	-.032	.109	-	-	-	-	-	-
Certainty	-	-	-.029*	.005	-.007	.468	-.005	.576
Justification	-	-	.005	.615	.011	.292	.002	.854
Source	-	-	.012	.211	-.002	.836	.006	.475
Attainment of truth	-	-	-.020*	.048	-.017	.077	-.001	.914
Constant	3.751	.000	.415	.000	.412	.000	.362	.000

*indicates significant results.
[a] $R^2 = .089$, $F_{(11, 380)} = 3.370$, $p = .000$.   [b] $R^2 = .078$, $F_{(14, 374)} = 2.251$, $p = .006$.   [c] $R^2 = .057$, $F_{(14, 374)} = 1.606$, $p = .075$.
[d] $R^2 = .061$, $F_{(14, 374)} = 1.725$, $p = .049$.

In interpreting the three other regressions in Table 6 (Sections B – D), which consider the three dimensions of critical thinking ability separately and also the four dimensions of epistemological beliefs separately, we can see that gender and low GCSE remain significant (at the 5% and 1% levels respectively) for *only* the inference dimension of critical thinking, with the direction of the relationship being the same as for the overall critical thinking/epistemological beliefs regression – being male increases the probability of getting a high critical thinking score whilst low GCSE decreases the probability of getting a high critical thinking score. Going to school outside the UK (and not taking a GCSE), on the other hand, is not significant for the inference dimension but does remain significant for both the analysis and evaluation critical thinking dimensions (once again in the same direction as for regression A – decreasing the probability of getting a high critical thinking score). There was some relationship between critical thinking dimensions and epistemological belief dimensions. These are within the analysis dimension of critical thinking – with both certainty and attainment of truth being significant (at the 1% and 5% levels respectively). The direction of the relationship was as expected – the more students were certain about knowledge and believed in the attainment of truth (i.e. the less sophisticated were their epistemology scores), the less likely they were to get a high critical thinking score. Consistent with the overall regression, there were no significant relationships between

critical thinking and subject module once the dimensions of epistemological beliefs had been added into the model.

6.3.2 Business and Psychology students

We looked at Business (i.e. Critical Thinking in Management) and Psychology (i.e. Exploring Psychology) students separately to determine whether there were any differences in the relationship between critical thinking ability and epistemological beliefs for these subject modules. These two samples were the largest of the seven subject groups (having 107 and 139 participants respectively) and therefore the most likely of the groups to show effects (the other subject groups only had between 30 and 43 participants). The results of the regressions are presented in Table 7.

Table 7 Regression results for the relationship between critical thinking ability and epistemological beliefs for Business and Psychology students.

Variable	A. Critical thinking: overall[a]		B. Critical thinking: analysis[b]		C. Critical thinking: evaluation[c]		D. Critical thinking: inference[d]	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
BUSINESS								
Male	.166	.611	-.037	.545	.032	.585	.060	.217
High GCSE	.108	.902	.070	.665	.146	.346	-.021	.867
Low GCSE	-1.117*	.004	-.063	.366	-.019	.780	-.203*	.000
School outside UK	-1.362*	.002	-.200*	.019	-.122	.129	-.113	.090
Epistemology								
Overall	-.026	.516	-	-	-	-	-	-
Certainty	-	-	-.043*	.037	-.002	.925	.013	.413
Justification	-	-	.019	.333	.000	.984	.011	.491
Source	-	-	-.006	.740	.010	.549	-.011	.451
Attainment of truth	-	-	-.011	.593	-.005	.809	-.016	.325
Constant	3.843	.000	.612	.004	.287	.148	.385	.020
PSYCHOLOGY								
Male	.285	.431	.046	.516	.023	.748	.013	.815
High GCSE	.703	.197	.124	.236	.023	.826	.069	.403
Low GCSE	-.189	.571	.137*	.036	-.073	.259	-.071	.167
School outside UK	-1.538	.098	-.369*	.039	-.219	.215	-.028	.840
Epistemology								
Overall	-.076	.052	-	-	-	-	-	-
Certainty	-	-	-.050*	.016	-.021	.298	-.037*	.021
Justification	-	-	-.009	.656	.002	.936	.000	.992
Source	-	-	.025	.189	-.006	.743	.019	.211
Attainment of truth	-	-	-.018	.323	-.028	.129	.001	.967
Constant	4.660	.000	.497	.003	.643	.000	.395	.003

*indicates significant results.
BUSINESS: [a]R^2 = .136, $F(5, 99)$ = 3.120, p = .012. [b]R^2 = .147, $F(8, 95)$ = 2.050, p = .049. [c]R^2 = .049, $F(8, 95)$ = .608, p = .769. [d]R^2 = .173, $F(8, 95)$ = 2.484, p = .017.
PSYCHOLOGY: [a]R^2 = .073, $F(5, 119)$ = 1.873, p = .104. [b]R^2 = .136, $F(8, 115)$ = 2.254, p = .028. [c]R^2 = .069, $F(8, 115)$ = 1.072, p = .388. [d]R^2 = .075, $F(8, 115)$ = 1.167, p = .325.

In interpreting the regression for overall critical thinking ability and overall epistemological beliefs for Business students (Table 7, Section A) the significant variables were low GCSE and going to school outside the UK, with no GCSE option (both significant at the 1% level). Both of these decrease the probability of getting a high critical thinking score. This is consistent with the full sample regression. However, there was no significant effect for gender despite there being a significant effect in the full sample regression. As with the full sample regression, there was no relationship between overall critical thinking ability and overall epistemological beliefs.

Looking at the critical thinking dimension regressions for Business (Table 7, Sections B – D) we can see that going to school outside the UK (and not having a GCSE option) is significant for the analysis dimension and low GCSE is significant for the inference dimension (at the 5% and 1% levels respectively). These are both consistent with the full sample regression. However, going to school outside the UK is not significant for the evaluation dimension and gender is not significant for the inference dimension, in contrast to the full sample. There was a significant relationship between analysis (critical thinking) and certainty (epistemology) (at 5%), consistent with the full sample regression, but there was no significant relationship between attainment of truth (epistemology) and analysis (critical thinking) in contrast to the full sample model. There were no significant relationships for evaluation (critical thinking) for Business students, also in contrast to the full sample model.

In interpreting the regression for overall critical thinking ability and overall epistemological beliefs for Psychology students (Table 7, Section A) we can see that there were *no* significant relationships between any of the variables, in contrast to both the Business model and the full sample model. There were, however, significant critical thinking/epistemology relationships within the dimensionality regressions (Table 7, Section B – D). Within the analysis dimension (critical thinking) the significant variables were low GCSE, going to school outside the UK/no GCSE option and certainty (epistemology) (all at the 5% level). School outside the UK and certainty are both consistent with *both* the full sample model and the Business model – students that went to school outside the UK and therefore did not take a GCSE and those that are more certain about knowledge are less likely to get a high critical thinking score. However, the significant relationship between low GCSE and the analysis dimension of critical thinking was not apparent in either the full sample or Business regressions and was positive – the opposite direction to what was expected – Psychology students with low GCSEs were *more* likely to get a high critical thinking score. When low GCSE has been significant in any of the other regressions it was negatively associated with critical thinking, not positively. Also apparent in the Psychology regression, but not in either the Business or full model, was a significant association between inference (critical thinking) and certainty (epistemology) – the more certain Psychology students were about knowledge in the Psychology discipline, the less likely they were to get a high critical thinking score. There were no significant relationships for evaluation (critical thinking) for Psychology students, consistent with Business students.

6.4 Changes in Critical Thinking and Epistemological Beliefs

These analyses have been conducted on the data provided by the 218 students who completed questionnaires at both times of testing. Table 8 shows the means and standard deviations for critical thinking and epistemological beliefs scores at Time 1 and Time 2[14]. Overall there is little difference between Time 1 and Time 2 mean scores. Across modules the differences between Time 1/Time 2 mean scores vary slightly although some of these go in the opposite direction to what would be expected. Given that enquiry-based modules are expected to improve critical thinking scores and aid in the development of more sophisticated epistemological beliefs, we would have expected critical thinking scores to go up and epistemological beliefs scores to go down. However, this was not the case for all modules.

Table 8 Descriptive statistics (means and standard deviations) for critical thinking and epistemological beliefs scores for students who provided data at *both* Time 1 and Time 2 (Time 2 in parentheses) (N = 218)

Module	Number participants	Critical thinking		Epistemological beliefs	
		Mean	SD	Mean	SD
Sociology: Current	28	2.982 (2.754)	1.782 (1.430)	18.407 (19.478)	4.190 (4.155)
Geography	28	3.235 (3.046)	1.459 (1.765)	22.286 (21.889)	3.924 (3.724)
Business	43	3.223 (2.827)	1.740 (1.822)	25.349 (26.714)	4.418 (4.104)
Psychology	72	3.049 (3.210)	1.554 (1.421)	20.634 (20.472)	3.837 (3.711)
Health	25	2.923 (3.307)	1.402 (1.409)	20.080 (21.320)	5.066 (3.210)
Law	22	3.133 (3.036)	1.711 (1.302)	20.111 (19.762)	4.310 (5.576)
Overall group	218	3.092 (3.045)	1.597 (1.538)	21.415 (21.824)	4.721 (4.710)

Two separate mixed between-within subjects Analysis of Variance tests were conducted to determine whether the subject modules in the evaluation had a differential impact on students' critical thinking skills and epistemological beliefs. These are discussed in turn below.

Critical thinking. For critical thinking there was no significant effect of time ($F_{(1, 212)}$ = .173, p = .678, partial η^2 = .001), i.e. ignoring the module, overall there was no significant change in critical thinking across time periods. Furthermore, there was no significant interaction between time and subject module ($F_{(5, 212)}$ = .683, p = .637, partial η^2 = .016), i.e. taking a particular module had no significant impact on changes in critical thinking from Time 1 to Time 2. We then included gender and GCSE as covariates into the model to determine whether these may be exerting an influence in students' critical thinking abilities. Once again, there was no significant effect of time ($F_{(1, 192)}$ = 1.108, p = .294 partial η^2 = .006), and no significant interaction between time and module ($F_{(5, 192)}$ = .353, p = .880. partial η^2 = .009).

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[14] Note that Sociology: Past is not included in these analyses as students only provided data at Time 1.

Epistemological beliefs. For epistemological beliefs there was a significant effect of time ($F(1, 199) = 4.972$, $p = .027$, partial $\eta^2 = .024$. This indicated that overall there was a significant change in epistemological beliefs across the two time periods. However, the interaction between time and module was not significant ($F(5, 199) = 1.146$, $p = .337$, partial $\eta^2 = .028$), i.e. taking a particular module had no significant impact on changes in epistemological beliefs from Time 1 to Time 2. Furthermore, when GCSE grades and gender were entered into the model as covariates the significant main effect of time disappeared ($F(1, 181) = .752$, $p = .387$, partial $\eta^2 = .004$). Once again, there was no significant interaction between time and module ($F(5, 181) = ..469$, $p = .799$, partial $\eta^2 = .013$).

6.5   Do Enquiry Modules Impact on Students' Academic Performance

Table 9 shows the correlations between Time 1 and Time 2 critical thinking and epistemological beliefs scores, GCSE scores, the 'study module grade' (i.e. the grade a student had achieved for the module in question), and the average grade of all other modules taken by a student in 2008/2009 (called 'consecutive modules grade') (see Section 2.3.2, Page 15, for an explanation of how these grades were calculated). Correlations were calculated using all available Time 1 and Time 2 data, excluding cases pairwise to achieve the largest possible sample sizes for comparison. Sample sizes varied from 200 to 416 for the various correlations[15].

Table 9 Correlations[1] between critical thinking and epistemological beliefs scores, module grades, and GCSE scores

	Critical thinking Time 1	Critical thinking Time 2	Epistem-ology Time 1	Epistem-ology Time 2	Study module grade	Consecutive modules grade	GCSE score
Critical thinking: Time 1	-						
Critical thinking: Time 2	.156*	-					
Epistemology: Time 1	-.115*	-.128	-				
Epistemology: Time 2	-.112	-.153*	.610**	-			
Study module grade	.119*	.063	-.135*	-.147*	-		
Consecutive modules grade	.162**	.202**	-.091	-.045	.495**	-	
GCSE score	.238**	.102	.015	.003	.246**	.292**	-

[1] Correlations were calculated using all available Time 1 and Time 2 data, excluding cases pairwise to achieve the largest possible sample sizes for comparison. Sample sizes vary from 200 to 416 for the various correlations.
* Correlation is significant at $p = .05$ (2-tailed).
** Correlation is significant at $p = .01$ (2-tailed).

As would be expected, correlations between the study module grade, consecutive modules grade, and GCSE score are positive and significant, all at the 1% level. The relationship between epistemological beliefs at Time 1 and Time 2 is also highly positive and significant

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[15] Sociology: Past students were not included in these calculations as these students only provided data at Time 1.

(at the 1% level). However, whilst the relationship between Time 1 and Time 2 critical thinking scores is positive and significant, this is lower than expected at only .156 and is only significant at the 5% level.

The relationship between the study module grade and critical thinking at Time 1 (.119) is positive and significant (at the 1% level). However, at Time 2 this relationship is lower and no longer significant (.063). However, the relationship between the consecutive modules grade and critical thinking at Time 1 is positive and significant. This correlation is higher at Time 2. Taken together these results suggest that the types of assessment for the consecutive modules require good critical thinking skills, whereas the types of assessment for the study modules do not. The correlation between the study module grade and epistemological beliefs at Time 1 is negative (-.135), as would be expected, and significant (at the 1% level). This correlation is higher at Time 2 (-.147). The relationship between the consecutive modules epistemological beliefs at Time 1 (-.091) is in the direction as expected but it not significant. Neither is this relationship significant for Time 2. This latter set of results suggests that whilst the assessments for the study modules are requiring a sophisticated type of epistemological beliefs, the assessments for the consecutive modules are not. Overall, the pattern of correlations indicates that the types of assessment for the consecutive modules are not requiring sophisticated epistemological beliefs, but are requiring good critical thinking skills. In contrast, the types of assessment for the study modules are requiring sophisticated epistemological beliefs but are not requiring particularly high critical thinking abilities.

We found some unexpected results in the correlations between critical thinking scores and GCSE; consistent with current research we would expect a significant, positive relationship between critical thinking abilities and GCSE score at both times of testing. We found this to be the case at Time 1 (.238, 1% level). However, the correlation was only .102 at Time 2 and was not longer significant. Furthermore, there was no significant change in the relationships between critical thinking and epistemological beliefs at Time 1 (-.115) and at Time 2 (-.153). When we ran correlations for the individual modules/subjects the pattern of correlations was the same as reported here for the overall sample. These results suggest one of two things: either that our measures are too weak to be picking up significant changes; or that the teaching on the modules is not making any significant difference to students' critical thinking abilities or epistemological beliefs.

6.6   Conclusions from the Quantitative Analyses

Our analyses suggest that there are significant differences between modules in epistemological beliefs (specifically for Business students, and between Sociology: Current and Geography students), but there are no significant differences between modules in critical thinking ability. Results also suggest a relationship between specific dimensions of critical thinking and epistemology; the more students were certain about knowledge and believed in the attainment of truth (i.e. the less sophisticated were their epistemology beliefs), the less likely they were to get a high critical thinking score. In addition, our analyses suggest that being male increases the probability of getting a high critical thinking score, whilst both low GCSE and going to school outside the UK (and not having the option of taking a GCSE) decrease the probability of getting a high critical thinking score. Our

results do not show, however, that taking a particular module has been particularly beneficial for improving students' critical thinking abilities or developing their epistemological beliefs. This could be because the teaching on the modules is not making any significant different to students' critical thinking abilities or their epistemological beliefs, or it could be a consequence of weak measures that are failing to pick up significant effects.

7 Answers to Key Questions

What variation is there in the way that enquiry is taught?

There are differences in the ways the six enquiry modules are taught that might have a marked impact on how students regard their work on these modules, i.e. whether they see their work as a form of introduction into a research community, or whether their work is just a means to help them do something that is required of them as a student.

- The Psychology Project module and the Project Preparation and Planning module (henceforth called Project Planning) are geared towards preparing students to undertake research projects/dissertations or extensive pieces of data analysis that form a specific part of their degree programme. The other four modules (Studying Society, Criminology, Evidence Based Practice, and Critical Thinking in Management), on the other hand, are more general in their intentions, introducing students to aspects of research skills/processes that are intended for use across a wider range of modules and disciplines. Teaching on these four modules is lecture and workshop based. Teaching on the Psychology Project and Project Planning modules is primarily supervisory based (although there are a few lectures at the beginning of the Project Planning module).

- The differences in the ways these modules are delivered can have a marked impact on the ways that students approach their work on these modules. For example, the aim of the Studying Society module was to teach students a range of basic research skills and students were given a list of instructions to adhere to for their assessment on the module. Gaining a good grade was simply a case of following these instructions and was not fully dependent on a deeper understanding of the research processes involved. This type of teaching/assessment may encourage a strategic or shallow approach to learning as opposed to a deep approach. Students reported, however, that the module gave them a good introduction to research skills and the assessment was useful for helping them to gain insight into the purpose of the module. The Psychology Project and Project Planning modules, in contrast, are more likely to induct students into a research community, where they learn an analytical evidence-based approach, because the assessments are more relevant to the wider discipline rather than to just learning specific research skills/processes. As such, work on these modules is more likely to encourage a deeper approach to learning.

- The module leaders interviewed were all of the opinion that enquiry-based learning is important for the effective resolution of a degree, and that to think critically and independently is one of the aims of higher education. However, they did not all have a shared understanding of what 'enquiry' is. In referring to the task of developing students' enquiry abilities module leaders did not always favour the term 'enquiry'. The Project Planning module leader favoured 'enquiry' and very much related this concept to 'self-independent research', The Psychology Project module leader also favoured 'enquiry'. This is because the term highlights that students are learning to seek

information and enquire about things, as well as learning to think critically. In contrast, the Studying Society module leader favoured terms such as developing 'skills and competencies'. The module leader for Critical Thinking in Management talked of the task of developing enquiry as more the ability to construct a sound argument and criticise an argument, with the enquiry aspects being more on the side. They see enquiry as being '… a little subset of critical thinking' with the objective being to understand and recognise a sound argument and critically evaluate the evidence. The module leader for Evidence Based Practice in Nursing favoured plainer language to refer to the task of developing students enquiry abilities – they talk to the students about 'questioning' practice and leave terms such as enquiry and critical thinking for later in a students studies. Within Criminology, the module leader used the terms 'critical thinking' and 'analysis'. They see enquiry as critically analysing what is going on and setting that within a specific research context. Whatever their conceptualisation of enquiry learning, all these module leaders were of the opinion that one of the main aims of enquiry is to get students to interpret and critically evaluate what they read.

What variation is there in students' readiness to undertake enquiry learning?

Students' readiness to undertake enquiry learning, and whether or not they felt that taking their respective module was important for a degree in their award subject, varied both across and within modules:

- Generally, students taking the Psychology Project, Project Planning, and Evidence Based Practice modules thought that the module was very important – Project Planning students because it gave them transferable skills, especially for their Level 3 project, Psychology Project students for giving them opportunities for independent learning and helping them achieve BPS accreditation for their degree, and Evidence Based Practice students because it was important for their wider practice, i.e. on their work placements. Criminology students also felt that taking the module was important for wider practice; specifically future careers or intended postgraduate study. Students from these four modules were, in the main, prepared to engage with the module and undertake the work required for its effective resolution.

- Not all Studying Society and Critical Thinking students were inclined to say that taking the module was important for the resolution of their degree. The Studying Society module appeared to be more useful for older students, whereas for the Critical Thinking in Management module, students currently taking the module found it less relevant (they could not see how it fitted in with their wider award) than did students who had taken the module the previous year. Students that saw these modules as being less important tended to be less inclined to engage with the modules.

- Across all modules students were generally able to explain the purpose of the modules and felt that they understood the objectives. Students' expectations within modules varied to some degree, but these appeared to be minor. The most variation was within the Studying Society module where differences in expectations were relative to the length of time a student had been out of formal education. A lot of the skills taught on this module were basic skills and students expectations and opinions of whether or not

the module was important for a degree in Sociology or its related disciplines appeared to be related to their levels of prior knowledge.

There were differences across modules re students' understanding of research and research skills/processes.

- The Studying Society and Project Planning students interviewed felt that what they were being taught on the module was appropriate and relevant to research being conducted in the wider discipline. The Sociology and Geography departments both place a heavy emphasis on teaching students to 'do research' (within the Geography department specifically, students are heavily involved in running their own research projects) and all the students interviewed were confident in knowing why they were taught enquiry and had good understanding of the various research skills/processes. Students from both modules felt that conducting active research projects was good for their overall confidence and was a positive and useful experience. Sociology students did, however, report difficulties with learning statistics.

- Within the Psychology Department students are also heavily involved in running their own research projects. Psychology Project students acknowledge the value of undertaking research and have a good understanding of literature searching processes, forming research questions, and gathering and interpreting evidence. Students are taught research methods throughout their degree and therefore also have an understanding of statistical processes and theory. The Criminology module is also directed at Psychology award students, as well as students on Law and Forensics awards. While students perceptions of what it means to 'do research' does not vary across these three disciplines, in contrast to Psychology students, Law and Forensics students taking the Criminology module struggle with their understanding of research processes; most likely because of a reduced emphasis on conducting active research projects.

- While the Business School and Health Professions both place a heavy emphasis on teaching students about research, students do not typically engage in their own research projects and therefore only have very limited first-hand experience of undertaking research. Despite this, Critical Thinking in Management (Business) students felt that they had a relatively good understanding of most research processes, although they were less confident about the statistical aspects. In contrast, Evidence Based Practice (Health Professions) students had a more varied understanding of research processes; from quite limited to relatively extensive. Students from both modules saw the value in research, felt it was an essential part of their degree, and felt that the opportunity to run more active research projects would have enhanced their understanding of research processes.

Students understanding of the development of knowledge within their chosen discipline varied considerably across modules:

- When asked how they would go about checking the validity of a statement relative to their discipline (see Appendix 3 for statements), students from the Critical Thinking in

Management module were able to provide more in-depth answers than did students from the other modules. Students who had taken the module the previous year were able to provide the most complete answers with some outlining the research questions they would ask. Current students tended to need more prompting from the interviewer.

- Many students emphasised the role of these enquiry modules in developing their ability to gather data, rather than their abilities in data analysis and interpretation; they referred principally to how they were going to collect data and had little to say about how they were going to analyse and interpret it. Only one student from a module other than Critical Thinking in Management (i.e. an Evidence Based Practice student) discussed the research questions implicit in any of the statements, and only one (a Studying Society student) discussed that they would need to formulate a research argument in order to effectively validate the statement. The lack of depth in replies from students on the Evidence Based Practice module is surprising given that a large component of the module is teaching students critical appraisal skills. These results indicate one of two things: that students have limited language skills with which to express what they had learned about analysis and interpretation; or they may simply have learned less. Whilst students from modules other than Evidence Based Practice and Critical Thinking in Management did report being taught to unpick research questions and critically analyse their own and others' work, it is only a small component of the modules and this was reflected in their answers. The Evidence Based Practice and Critical Thinking modules, on the other hand, are heavily concentrated on this aspect of enquiry teaching. Critical Thinking students reported that the form of teaching in module workshops is a major contributing factor in their learning how to think critically; tutors on the course constantly questions students and gets them to examine and explain their answers.

- Students who had taken their respective module the previous year were more easily able to validate statements such as those given than were students currently taking the module. The majority of students across all modules felt that their respective module was important for helping them to develop knowledge of how to validate research questions such as those presented. However, students who had taken the module the previous year were more likely to say that their learning was as much as consequence of taking other modules on their degree.

Are students clear about the capabilities we want them to develop and the knowledge we want them to acquire?

Some of the language in module descriptors implies shared purposes by staff in different parts of the University to the extent that the development of a capability for enquiry is expressed in general terms. Descriptions of learning outcomes in generic terms tend to give little indication of the demand that is being made of students, however. There is substantial variation in how members of staff are interpreting the University learning outcome statements attached to each module descriptor. There are also difficulties in defining what should be regarded as an 'enquiry' module as module descriptors that incorporate some element of enquiry skills are written with a range of purposes in mind.

Generally, module assessments convey the intentions of lecturers although they are not always understood and acted upon by students:

- Some Studying Society students felt that it was not always clear what was expected of them in terms of the portfolio assessment or the group presentation, and for others it was not always obvious to students what they needed to do to get a good grade. However, this appeared to be related to a lack of motivation in some students to read the module handbook or pay attention to instructions given throughout the module. In this module, completing the assessment to the required standard is simply a case of following a set of given instructions (which were very clearly laid out). If students follow these instructions then they cannot fail to achieve a good grade, whatever their level of understanding about the processes involved.

- Evidence Based Practice students also exhibited a lack of motivation in searching for the requisite assessment information. The assignment and marking criteria are freely and easily accessible on Blackboard but some students failed to use this to its full advantage, preferring the information to be handed out in class. This was partly related to a lack of information about Blackboard in general. There was, however, also a lack of motivation to find out how to use Blackboard. This demonstrates a preference for being 'spoon-fed' information, as opposed to proactively seeking it.

- A number of Project Planning students reported not knowing what was expected of them in their assessments, although this was generally a reflection of different supervisory practices – some supervisors appeared to give a clearer idea of assessment procedures, criteria and deadlines than did others. The assessments are linked to the Level 3 project/dissertation and finding a starting point and formulating research questions was one of the major challenges for students. The guidance of the tutor was essential for helping students to deal with this issue.

- Psychology students also experienced differences in supervisory practices, especially in relation to having deadlines for various stages of the project. Some students would have liked clearer deadlines, whereas other students were happier with their supervisor having a more laid back approach. The lack of consistency in supervisory practices does not imply a lack of shared understanding in developing students' enquiry abilities, however. The majority of Psychology students understood very well what was expected of them in terms of the assessment procedures and what it took to get a good grade (these were outlined in the module handbook), although there were students who would have liked aspects of this clarified, for example, as to the difference between a 2:2 and 2:1. How well students understood the assessment was to some extent related to the amount of support a student received from their supervisor, although students taking Sport and Exercise Psychology experienced ambiguous expectations because their supervisor was based in a different department.

- There were reports by some Criminology students that the module assessments do not adequately convey what is required. Students reported that the criteria in the handbook was difficult to understand and would have liked the research project requirements to

have been explained earlier on in the module. Differences in how students reacted to the assignment were generally related to the award the students were taking, however. Students on straight Law awards, where active research training was very limited, found the assessment more difficult. Students' lack of understanding may be partly related to a mix up with room allocations which meant that some students missed the session on the assignment. However, the Criminology module leader reported that students were increasingly finding the assessments difficult year-on-year, but could not explain why. Colleagues on the module have discussed changing the research project assignment to an essay but are concerned that it would remove the critical thinking aspect.

- Generally, Critical Thinking in Management students seemed to be clear in terms of what was expected of them for the assessments, especially in relation to providing critical evidence. However, this is to be expected as it is a 'critical thinking' module. The module leader felt, however, that some students were not always so clear on what was expected of them.

In the main, feedback on all the modules was congruent with the promotion of students' enquiry learning and when feedback was related to assessment criteria it was particularly useful. Specifically of note:

- Studying Society and Critical Thinking in Management students were very happy with their feedback which was generally linked to marking criteria, with reference to the appropriate learning outcomes. Critical Thinking students reported receiving additional 'tips' to help them with future work. One student stated: 'The things they gave me helped me to get a 14 in the next piece of coursework'. Some Studying Society students were reluctant to read their feedback, however, because it 'made me feel a bit of a failure'. This reluctance appeared to be more associated with younger students at the beginning of their studies and tended to dissipate over time as students gained more confidence in their abilities.

- Feedback provided to Project Planning students is also generally linked to marking criteria. Students reported being happy with their feedback but some would have liked more verbal, face-to-face feedback. They had this type of feedback in their first year and thought it would have been beneficial for this to continue further into their studies.

- There were conflicting reports about the usefulness of feedback given to Criminology students. Some students were happy with the feedback they received, whilst others were not. There were two areas where dissatisfaction was experienced: feedback was provided on the front sheet but not on the actual assignment, meaning that students could not relate the points to specific sections; positive comments were given but not negative or constructive comments, meaning that students did not know what or where they needed to improve.

- Within Criminology there seems to be a lack of shared understanding among tutors about the assignments that affected the development of students enquiry abilities; some students reported that not all tutors knew what the research project assignment entailed and they were therefore unable to advise effectively on it.

What specific experiences contribute to students' development of their ability to review and generate knowledge?

Students reported a number of challenges/difficulties connected with taking the modules. This impacted on students' motivation to engage with the modules and their subsequent ability to review and generate knowledge:

- Studying Society and Psychology Project students reported difficulties with time management and keeping up with the work. Students from both modules suggested that the importance of time management could have been made clearer.

- Both Psychology and Project Planning students reported experiencing difficulties in choosing the area in which to base their Level 3 dissertation/project, with some students saying that they would have liked more guidance. Some Project Planning students felt that trying to formulate a topic and find a starting point from the lectures was quite difficult because the lecture content was presented in terms of very broad concepts, whereas their projects were very specific. This issue was discussed by the Project Planning module leader who suggested that one of the most challenging aspects to delivering the module was getting students to think creatively and choose their own dissertation topics. Despite his conviction that the Geography department does provide students with the opportunities and relevant information to aid their decision-making, he reported that there are increasingly some students that still want to be 'spoon-fed', or told what to do.

- The notion of students being 'spoon-fed' can be seen in to a lesser degree in Studying Society students requests for more checklists, rather than they themselves having to check back in their portfolios. Consistent with this is the Studying Society module leader's assertion that that one of the major challenges is to 'get students to stand on their own two feet'.

- A preference for being 'spoon-fed' would appear to be more apparent in younger students; 'mature' students *from all modules* seem to take a more proactive approach to their work. This effect is also apparent in time-keeping, with older students from all modules being more able to prioritise their work.

- Psychology students experienced difficulties with getting students from other levels to participate in the voucher system (employed to get other students to act as research participants). Quite a few students experienced this problem and felt that the importance of the system should be given greater emphasis with Level 1 and Level 2 students.

- Psychology students also reported that the intensive work involved in undertaking the module, which was exacerbated by problems with getting research participants, had had a major detrimental effect on the time they had available to dedicate to other modules. They also felt confused by the implicit communication from some tutors that the Psychology Project was the most important part of their degree and as such took precedence over other modules. Criminology students also reported that the level of

work involved in taking the module (more reading in contrast to other modules) had impacted detrimentally on their other work.

- In contrast to the other modules, students from the Critical Thinking in Management module experienced few challenges or difficulties taking the module. There were a few reports of difficulties working in groups and conversing with non-English speaking students but these were minor issues, and difficulties such as those reported in the other modules were not experienced by the Critical Thinking students who took part in the interviews.

In the main, systematic faculty mechanisms to help students improve and evaluate their practice were limited. Across all modules, students were free to email tutors as and when was necessary. However, outside of formal evaluations only the Evidence Based Practice Module had more systematic procedures for aiding and evaluating students' practice. Evidence Based Practice students reported experiencing difficulties understanding the critical nature of the module and there was a critical appraisal assessment which students were concerned about completing. In order to circumvent students' concerns, tutors employ a session-based self-report system to help them monitor which students need more targeted help. Students are also provided with critical appraisal tools (see Pages 29-30) that help guide their appraisals. Group reflection outside of formal sessions is also actively encouraged and students referred to the importance of this in helping their understanding.

To what extent does other teaching on the course refer explicitly to students' learning on the enquiry skills module?

There was some evidence of linkage between enquiry modules and other modules on a student's award:

- Elements of the Project Planning module are discussed within other modules in the Geography programme – the module is part of a cohesive set of enquiry-based modules that take students to the end of their degree. This is made very explicit to students. The Geography department link all the modules on Geography awards and there is a definite expectation that student learning will be transferred to other modules. The structure of Geography awards is such that cross-thinking between modules is embedded within a student's programme of work.

- Modules in Health Professions are also set up so that they are all linked, and all assess students on the same kinds of research skills/processes. However, in contrast to the Project Planning module, the links are implicit, rather than explicit, and students are often left to formulate the links for themselves.

- Studying Society is one of a number of modules in Sociology and its related awards which as a whole teach research skills that will take students through their degree. However, there is no other formal linking of modules within Sociology awards. There is an expectation that processes learnt in the module will be transferred to other modules, although it is not as explicit as it appears to be for Project Planning students. The

module leader for the Studying Society would welcome more linkage/collaboration between modules/staff, and feels that this would encourage transference of knowledge.

- The Critical Thinking in Management module is presented to students as a being there to help them with other modules within their Business award. However, the module is not formally linked to any other modules on Business awards; from the students' perspective their modules within Business are presented to them in isolation. Despite this, there were students who felt that taking the Critical Thinking module made it easier for them to work out what was required in other modules. In the main, students reported that assessment requirements were consistent across modules, However, it is not made explicit in other Business modules (as reported by students) that students get higher marks for providing critical evidence in their work, despite this in fact being the case.

- The Psychology Project is presented in isolation from other modules except Research Methods modules to some extent, and the project is not formally linked to other modules. There are other modules that deliver enquiry, but these are not formally linked in any way to other modules; students are left to formulate the links themselves. Students did say, however, that it is implicit that students link what they have learnt on the various modules.

- The Criminology module is another enquiry-based module that is not formally linked to other modules on related awards. Because Criminology is a cross-disciplinary module, lectures on other modules do not generally make reference to it; while it is sometimes mentioned, this is not consistent. The module leader reported that linking the Criminology module to other modules was difficult due to its cross disciplinary nature. Students reported that it is implicit within all their modules that they formulate links within and across disciplines and the awards that relate to this module (Law, Forensics, and Psychology) generally assess ability to perform the same kinds of processes as examined in the Criminology module, although Law modules do not require such a high level of critical thinking ability in their assessments.

There was evidence of transference of learning to other modules:

- In general, Studying Society students (both current and previous year's students) reported that the module was good for getting them started on their degree and was beneficial for their academic researching and writing, and their learning in general. One student even reported that some of the techniques taught in the module helped them in their job outside of the University. In addition, students on joint awards commented that their learning was transferrable to their work on their other award. However, some students were unsure as to whether any benefits were *only* a result of taking the Studying Society module.

- Students' reports that they were transferring their learning on the Studying Society module to other modules are in direct contrast to the views of the module leader. He was of the opinion that students were *not* applying their learning to other modules. He

did suggest, however, that the modular degree system does not support cross-thinking between modules.

- Project Planning students (current and from the previous year) reported that the module had helped them to be more specific and focused in their academic work and was instrumental in helping them to critique other people's work. Furthermore, the Project Planning module leader reported that he and his colleagues can see the benefits of taking the module in students' Level 3 achievements – not only in their academic work but also in their understanding of the value of independent learning.

- Students on the Evidence Based Practice module reported that concepts learned throughout the module had been transferable to other modules, despite opportunities to use what they had learned being limited because they had not had many assignments, only exams. The linkages between modules on Health Professions awards, although implicit, facilitated transference of learning, not only to other modules but also to students work placements.

- In the main, Critical Thinking in Management students reported that the concepts they had learnt in the module had helped them to direct their reading and look at assignments in a different way. However, there was one current student who was unsure whether taking the module would help in other modules, as well as a student from the previous year who felt that taking the module had not affected their approach to their work at all. The Critical Thinking module leader was sceptical that students were transferring their learning to other modules. He felt that students see separate modules as 'compartmentalised' and, as a result, do not transfer their learning from one module to another.

- The majority of Criminology students also reported that they were able transfer their learning from this module to other modules; although this view was not unanimous and one student thought that transference of learning was the other way round (learning on other awards was more transferable to the Criminology module). Differences of viewpoint were *not* award specific. Students reported that where their modules were linked within disciplines it helped with transference of learning. They suggested that if modules were formally linked *across* disciplines then it would better help them to apply their learning to other modules.

- In contrast to the other modules, Psychology Project students felt that taking the module had not impacted on how they approached their academic work. The module is presented too late in their degree and, generally, students considered it more a case of learning from other modules being transferred to their Psychology Project. Some Psychology Project students felt that other modules presented at the same time as their project could be having a detrimental effect on their project work as they raised questions as to whether students should be taking a more critical approach to their project work.

- The value of taking enquiry modules becomes more apparent to a student the further they are into their degree – previous students interviewed considered their respective module to be more relevant for their learning than did current students.

Are students developing the knowledge and capabilities we want them to develop?

There are a number of findings from the quantitative analyses:

- The quantitative analyses suggest that there are statistically significant differences between subject modules in epistemological beliefs. Specifically, baseline scores (i.e. those taken at the start of the enquiry-based modules) showed that there are significant differences are between Business students (taking the Critical Thinking in Management module) and all other modules, with Business students having the less sophisticated epistemological beliefs. There were also differences between Sociology (Studying Society) and Geography (Project Planning) students, with Sociology students having the more sophisticated epistemological beliefs.

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- There were not, however, any significant differences between subject modules in levels of critical thinking ability. Students' baseline critical thinking abilities (i.e. abilities assessed at the start of the enquiry-based modules) were low for all students, whatever the module taken.

- Our analyses suggest a relationship between various background variables and critical thinking ability; being male increases the probability of getting a high critical thinking score, whilst both low GCSE and going to school outside the UK (and not having the option of taking a GCSE) decrease the probability of getting a high critical thinking score.

- Analyses suggest that there is no relationship between overall critical thinking ability and overall students' epistemological beliefs. However, when we analysed the specific dimensions of critical thinking and epistemological beliefs, within the analysis dimension of critical thinking, both certainty and attainment of truth (epistemology dimensions) were significant; the more students were certain about knowledge and believed in the attainment of truth (i.e. the less sophisticated were their epistemology beliefs), the less likely they were to get a high critical thinking score. This indicates that in order to achieve a high level of critical thinking ability, it is important to have sophisticated epistemological beliefs. We found differences between Business and Psychology students; the more certain Psychology students were about knowledge, the less likely they were to get a high critical thinking score. This effect was not apparent for Business students.

- Given that the enquiry-based modules in this study are aimed at improving critical thinking abilities we would have expected critical thinking abilities to rise across the period of the modules. However, there was no significant improvement in critical thinking abilities across the period of the modules (taking into account GCSE score and gender). Neither was there any significant change in students' epistemological beliefs across the period of the modules. Nor was there any significant change in the

relationships between critical thinking abilities and epistemological beliefs. These results suggest one of two things; either that our measures are too weak to be picking up significant effects; or that the teaching on the modules is not making any significant different to students critical thinking abilities or their epistemological beliefs.

- The pattern of correlations between critical thinking/epistemology scores, enquiry-based module grades, and grades for the other modules that students take during their degree (i.e. the consecutive modules) indicates that the types of assessment for the enquiry-based modules are requiring sophisticated epistemological beliefs, but are not requiring particularly high critical thinking abilities. In contrast, the types of assessment for the consecutive modules are requiring good critical thinking abilities, but are not requiring sophisticated epistemological beliefs.

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Appendix 1   Staff Interview Schedule Proforma

Enquiry learning	There are different ways of referring to the task of developing students' enquiry abilities such as 'critical thinking', 'critical reasoning', 'argument', and 'enquiry'. What terminology do you favour and WHY? / How do you conceptualise enquiry learning? Could you give me an example of the type of enquiry/critical reasoning that you are hoping students will develop? How important do you think this capacity for enquiry/critical reasoning is within a degree programme in [degree subject]? Do you think there is anything distinctive about enquiry/critical reasoning within [degree subject] - or does it look the same in every subject across the university? (If suggests distinctive - probe and ask in what way). To what extent do you hope that the outcomes from your teaching /from the module will affect the way in which students approach their work in other modules? Do you have any information or evidence which indicates whether these hopes are being fulfilled? What factors are currently making it more or less likely that these hopes will be fulfilled?
The module	(Refer directly to the written aims of the module) Can I just check first whether these written aims really capture what you are trying to achieve in your teaching? Could you briefly explain to me what these aims mean to you? How well do you think the students understand these objectives? To what extent do they share these objectives? What problems do you experience in trying to achieve your aims? Could you briefly describe the kind of teaching/learning that happens in this module? What do you do and what do they do? What do the students do in your module which you think are the most important for affecting whether they really move on as a result of the module? During the teaching of the module how do you infer a sense of what the students are making of it all? How do you assess enquiry learning in your module? In your assessments what is the critical difference between a student who is just failing and one who is just passing? What are the critical differences between the work of a student who is getting 55% and one who is getting 70%?
The students	Describe the typical level of prior ability of students in terms of enquiry skills/critical reasoning when they begin your module? How much variation is there in students' enquiry abilities when they start the module? What challenges/difficulties does the module present for the students? Have you noticed any specific ways they try to address any difficulties?

Appendix 2   Student Interview Schedule Proforma: 2007/2008 – Interview 1

Framework for interviews	The interview schedule is organised with the main questions in bold, followed by further prompts.
About the student	Name and Level? Age? Ethnic background/Nationality? English as first language? Degree/award?
The module	What were your initial expectations of the module? Did the module meet with your expectations? What was your understanding of the purpose of the module? What do you think the module was trying to achieve? [Insert description of module] How well do you feel you understood the objectives of the module? How easy did you find it to understand what you were being taught in the module? Do you think that what you did in this module is important within a degree programme in [degree subject]? Do you think that what you did in this module is important for every subject across the university? What challenges/difficulties do you feel are faced by students taking this module? How do other students address any challenges/difficulties? How did you address any that you faced? Did you have any knowledge of independent learning processes and skills prior to starting the module? Did you experience any differences in how you approached your work on this module and how other students approached their work? To what extent do you feel you understood the assessment procedures? What do you believe were the tutors' expectations of you?
Understanding the development of knowledge in [degree subject]	Present students with the hypothetical statement: [Insert Statement 1: see Appendix 6] or [Insert Statement 2: see Appendix 6].

	Questions:
	
	How would someone in [degree subject] go about checking the validity of this statement?
	
	In taking this module how have you learned that this is the way of validating such a statement?
	    How do you know that? (Ask student to justify their position)
	    Is that the [degree subject] way of finding out about these issues? (Ask students to reflect on what they said / on why they think that this is the answer)
	    Describe the kind of teaching / learning that took place in the module? What did you do? What did your module tutor do?

Transference of learning	Has your learning on this module affected the way in which you approach your work on other modules or approach learning in general? How? (Looking for evidence of changes in student behaviour and attitudes, and evidence of being able to form connections across modules. Ask for specific examples) Do you feel that the module has had a beneficial effect on how you approach researching and writing in an academic context? Has what you have learnt helped you to complete assignments for other modules? Do other modules on your [degree subject] award assess you on your ability to perform the kinds of processes presented in the (name of module) module? (Ask for examples) Do you get feedback? Have lecturers in other modules made reference to the [name of module] module? Do the things that other lecturers say about how to approach your learning match in with what you were taught on the [name of module] module? Which aspects of the module do you feel are the most important for helping you to progress on other modules?

Appendix 3   Student Interview Schedule Proforma: 2007/2008 – Follow-Up Interview

Framework for interviews	The interview schedule is organised with the main questions in bold, followed by further prompts.
About the student	Check that student is still on the same award / reiterate what module they are here to discuss.
The module and transference of learning	Ask whether students see the value of taking the module a year further into their award / Discuss what students previously said about transferring learning. In this current year do you feel taking the module has affected the way in which you approach your work on other modules or approach learning in general? How? (Ask about effects on academic researching, writing, assignments?) In terms of helping you with your work do you feel that there are systematic faculty mechanisms to help you improve and evaluate your practice? Do you get feedback? Have lecturers in other modules made reference to the [name of module] module? Have they assessed you on your ability to perform the same kind of processes? Does what other lectures say match in with your learning on the (name of module) module?
Research-informed teaching	What is learning to 'do research' for? What does doing 'research' mean for you as a student? Do you feel there is any value in doing research? Why/why not? (Also in comparison to other activities?) Do you think the development of research techniques is an essential part of your award? What do you think is appropriate/good practice for you to experience in terms of teaching research? What emphasis does your module/department put on teaching you to do research? Do you feel your teaching/learning is organised so as to engage you in research projects? Should it be/not be? Do you feel your understanding of the research process is good or bad? Has it resulted in positive or negative experiences when asked to partake in the research process? Do you connect the content of your course with the research undertaken in the discipline? Is it important to be taught by staff involved in research? Is research discussed in class? Have you participated in any research seminars/contributed to a research project/paper/worked as a research assistant? Or participated as a research subject?

Appendix 4   Student Interview Schedule Proforma: 2008/2009 – Interview 1

Framework for interviews	The interview schedule is organised with the main questions in bold, followed by further prompts.
About the student	Name and Level? Age? Ethnic background/Nationality? English as first language? Degree/award?
The module	**What were your initial expectations of the module? So far has the module met with your expectations?** **What is your understanding of the purpose of the module? What do you think the module is trying to achieve?** [Insert description of module] How well do you feel you understand the objectives of the module? How easy do you find it to understand what you are being taught in the module? Do you think that what you do in this module is important within a degree programme in [degree subject]? Do you think that what you do in this module is important for every subject across the university? So far what challenges/difficulties do you feel are faced by students taking this module? How do other students address any challenges/difficulties? How did you address any that you face? Did you have any knowledge of independent learning processes and skills prior to starting the module? Are you experiencing any differences in how you approach your work on this module and how other students approach their work? To what extent do you feel you understand the assessment procedures? What do you believe are the tutors' expectations of you?
Transference of learning	**Do you think your learning on this module is likely to affect the way in which you approach your work on other modules or approach learning in general? How? Is it likely to have a beneficial effect on how you approach researching and writing in an academic context?** (Looking for evidence of changes in student behaviour and attitudes, and evidence of being able to form connections across modules. Ask for specific examples) **Are lecturers in other modules making reference to the [name of module] module?** Do the things that other lecturers say about how to approach your learning match in with what you are being taught on the [name of module] module?

Appendix 5   Student Interview Schedule Proforma: 2008/2009 – Interview 2

Framework for interviews	The interview schedule is organised with the main questions in bold, followed by further prompts.
About the student	Check that student is still on the same award.
The module	Check whether student's expectations were the same/the module has met with expectations. [Insert description of module] Check whether student still feels they understand the objectives of the module/whether they still feel it is important (or not). Discuss challenges that students mentioned before and ask if they are the same, and how they/other students address challenges? Are you experiencing any differences in how you approach your work on this module and how other students approach their work?

Understanding the development of knowledge in [degree subject]	Present students with the hypothetical statement:
	
	[Insert Statement 1: see Appendix 6]
	or
	[Insert Statement 2: see Appendix 6].
	
	Questions:
	How would someone in [degree subject] go about checking the validity of this statement?
	
	In taking this module how have you learned that this is the way of validating such a statement?
	    How do you know that? (Ask student to justify their position)
	    Is that the [degree subject] way of finding out about these issues? (Ask students to reflect on what they said / on why they think that this is the answer)
	    Describe the kind of teaching / learning that took place in the module? What did you do? What did your module tutor do?
	
	When I say to you the term 'critical reasoning/critical thinking', what do you understand that to mean?

Transference of learning	Discuss what students previously said about transferring learning. Has your learning on this module affected the way in which you approach your work on other modules or approach learning in general? How? (What about on academic researching, writing, assignments?) (Looking for evidence of changes in student behaviour and attitudes, and evidence of being able to form connections across modules. Ask for specific examples) To what extent do you feel you understand the assessment procedures? What do you believe are the tutors' expectations of you? Do other modules on your award assess you on your ability to perform the kinds of processes presented in the [name of module] module? (Ask for examples) Do you feel that there are systematic faculty mechanisms to help you improve and evaluate your practice? Do you get feedback? Have lecturers in other modules made reference to the [name of module] module? Do the things that other lecturers say about how to approach your learning match in with what you were taught on the [name of module] module? Which aspects of the module do you feel are the most important for helping you to progress on other modules?
Research-informed teaching	What is learning to 'do research' for? What does doing 'research' mean for you as a student? Do you feel there is any value in doing research? Why/why not? (Also in comparison to other activities?) Do you think the development of research techniques is an essential part of your award? What do you think is appropriate/good practice for you to experience in terms of teaching research? What emphasis does your module/department put on teaching you to do research? Do you feel your teaching/learning is organised so as to engage you in research projects? Should it be/not be? Do you feel your understanding of the research process is good or bad? Has it resulted in positive or negative experiences when asked to partake in the research process? Do you connect the content of your course with the research undertaken in the discipline? Is it important to be taught by staff involved in research? Is research discussed in class? Have you participated in any research seminars/contributed to a research project/paper/worked as a research assistant? Or participated as a research subject?

Appendix 6 'Development of Knowledge' Statements

Students were requested to choose one of two statements (see table below) and were then asked the following questions:

(i)   'How would someone in [degree subject] go about checking the validity of this statement?'
(ii)   'In taking this module how have you learned that this is the way of validating such a statement?'

Appendix 6   'Development of Knowledge' statements for each module

Module	Statement 1	Statement 2
Studying Society – Sociology	People in the worst post-code areas tend to suffer more ill health than those in the best postcode areas.	The Internet is not all it's cracked up to be.
Project Preparation & Planning – Geography	Organic food consumption will be related to spatial socio-economic patterns within a city.	Land use determines the microclimate of a landscape.
Critical Thinking in Management – Business	Large businesses tend to be more efficient than small businesses.	The most effective way to get people more motivated in this business is to offer more money for better performance.
Psychology Project – Psychology	Large studies tell us more about the human mind than small studies.	Experimental/quantitative research in psychology is better than qualitative research.
Evidence Based Practice in Nursing – Health Professions	Nurse led service delivery is of special value to patient care.	Maintaining older people in their own homes is associated with improved recovery times after treatment.
Criminology – Law	Many criminological theories say that crime is based on defective social regulation and that people deviate because society is so flawed.	Criminology is an eclectic mix of theories which has drawn from a range of other disciplines.

Appendix 7   Epistemological Beliefs Questionnaire

Appendix 7   Epistemological beliefs items and dimensions

Epistemological beliefs	
Dimension	Item
Certainty	1. In this subject, most work has only one right answer
Certainty	2. Principles in this field are unchanging
Justification: personal	3. First-hand experience is the best way of knowing something in this field
Justification: personal	4. There is really no way of determining whether someone has the right answers in this field
Source: authority	5. Sometimes you just have to accept answers from the experts in this field, even if you don't understand them
Source: authority	6. If you read something in a textbook for this subject you can be sure it's true
Attainment of truth	7. Experts in this field can ultimately get to the truth
Attainment of truth	8. If scholars try hard enough, they can find the answers to almost anything

Appendix 8   Distribution of Critical Thinking Items

Appendix 8   Distribution of critical thinking items and dimensions per item set

Dimension	Item sets and item numbers for each set				
	Set 1	Set 2	Set 3	Set 4	Set 5
evaluation	2				
evaluation	3				
inference	4				4
analysis	5				
evaluation	6	6			
inference	8	8			
inference	9	9			
inference	10	10			
analysis	11				11
evaluation		7	7		
analysis		12	12		
inference		16			
analysis		18			
evaluation		30			
evaluation			14		
analysis			15	15	
inference			21	21	
inference			22	22	
inference			24		
inference			25		
analysis			27		27
inference				17	
analysis				20	
analysis				23	
evaluation				26	26
inference				28	28
evaluation				29	29
inference					1
inference					13
inference					19

Appendix 9   Definitions of Quantitative Variables

Appendix 9 Definitions of quantitative variables

Variable	Definition
Male	1 if Male, 0 otherwise
Law	1 if student enrolled on Law award, 0 otherwise
Business	1 if student enrolled on Business award, 0 otherwise
Health	1 if student enrolled on Health award, 0 otherwise
Psychology	1 if student enrolled on Psychology award, 0 otherwise
Geography	1 if student enrolled on Geography award, 0 otherwise
Sociology: Current	1 if student enrolled on current Health award, 0 otherwise
Sociology: Past	1 if student enrolled on previous years Health award, 0 otherwise
Low GCSE	1 if low GCSE, 0 otherwise. Low GCSE = the sum of performance at GCSE mathematics and English = 0, 1 or 2, given that A*=4, A=3, B=2, C=1, below C=0
Mid GCSE	I if mid GCSE, 0 otherwise. Mid GCSE = the sum of performance at GCSE mathematics and English = 3, 4 or 5, given that A*=4, A=3, B=2, C=1, below C=0
High GCSE	1 if high GCSE, 0 otherwise. High GCSE = the sum of performance at GCSE mathematics and English = 6, 7 or 8, given that A*=4, A=3, B=2, C=1, below C=0
School outside UK / no GCSE	1 if student went to school outside the UK and did not have the option of taking a GCSE, 0 otherwise.