UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

School of Education

Theory and Practice in Critical Thinking A Level and the Evacuation of Knowledge Thesis

by

Mark Franklin Howarth

Thesis for the degree of Doctor of Philosophy

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ABSTRACT

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The concept of critical thinking has been influential in curriculum policy and practice across sectors of UK education and has been identified as a key consideration in recent consultations about A level reform. The purpose of this study is to describe the meanings attributed to critical thinking in expert accounts and to compare these with policy maker and participant meanings in the context of A level Critical Thinking. A distinctive feature is the attention given to underlying epistemological and ontological assumptions of these accounts. The prevailing concept of critical thinking is of a universally applicable set of skills and dispositions for assessing reasoning and evidence, which derives from the informal logic movement and rests on a fallibilist epistemology. This contrasts with discipline specific concepts. In social realist theory critical thinking has been associated with 'soft genericism' and implicated in an 'evacuation of knowledge'. A critique and extension of this theory is proposed which differentiates between multiple forms and functions of critical thinking in the curriculum. Evidence on student views was gathered in a mixed methods case study, supplemented by a teacher response activity. Students attributed high value to critical thinking and were confident in their ability to apply skills to academic and life situations; whilst they felt that these skills were not taught in other subjects. In apparent contradiction, teachers suggested correspondence between the skills expected for high performance across subjects and those in A level Critical Thinking. Additionally, they emphasized the importance of subject specific contextualising to depth of critical evaluation. It was concluded that knowledge and critical thinking are complementary rather than conflicting forces in education and that a differently conceived critical thinking based on social constructionist epistemology is compatible with and essential to the knowledge curriculum envisaged by social realists.

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DECLARATION OF AUTHORSHIP

I, Mark F. Howarth, declare that the thesis entitled

THEORY AND PRACTICE IN A LEVEL CRITICAL THINKING AND THE EVACUATION OF KNOWLEDGE THESIS

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- parts of this work have been published as:

  Howarth, M.F. 2011, Critical thinking in post compulsory education and training: extended application of the curriculum theory of Young and Furedi, in: Hummingbird, University of Southampton Doctoral Research Journal, issue 2 pp. 39-46

Signed: ……..

Date:…….

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I dedicate the thesis to the memory of my mother and father and thank them for their unwavering belief in the value of an education they were unable to access themselves.

List of abbreviations

A level	Advanced level course. The most common academic course in the UK taken by 16-18 year olds and a standard entry qualification for higher education.
AS	Advanced Supplementary. A qualification in its own right, this is typically the first half of an A level course.
A2	The second half of an A level qualification which makes up the difference from AS to A level.
BIS	Government department for Business, Innovation and Skills.
CfL&T	Centre for Leaning and Teaching based at Newcastle University.
CT	Critical thinking. Abbreviation used where following another author's usage and at specified points. Critical Thinking is written with upper case letters where referring to a course title and in lower case for the general concept.
DCSF	Department for Children, Schools and Families.
DfES	Department for Education and Science.
DfE	Department for Education. Current government department for education and children's services. The last two entries refer to equivalent department titles under previous governments.
FE	Further Education. Colleges offering a range of academic and vocational courses for all ages 16+ and some 14-16 provision.
HE	Higher Education. Sector including universities and mainly running degree courses at undergraduate and postgraduate level. HEIs are Higher Education Institutions.
IfL	Institute for Learning. Professional body for FE lecturers, introduced in 2007.
LLN	Language, literacy and numeracy – the designated basic skills in the government's Skills for Life strategy.
LSC	Learning and Skills Council. Government funding body for FE prior to 2010.
LSDA	Learning and Skills Development Agency. Responsible for workforce and quality development in FE from 2000 to 2006. Replaced by LSIS.
LSIS	Learning and Skills Improvement Service. Responsible for the standards, qualifications and strategic oversight of the FE and Skills workforce in England.
LSRC	Learning and Skills Research Centre. Research commissioning arm of LSDA.

NGT	Nominal Group Technique. Research method involving identification of preferences by voting and group discussion.
NVQ	National Vocational Qualifications. Until 2010 the main framework for work related training across sectors and levels.
OFQUAL	Office of Qualifications and Examinations Regulation. Responsible for regulating qualifications, examinations and assessments in England.
OFSTED	Office for Standards in Education. Responsible for inspection of schools and FE.
PCET	Post Compulsory Education and Training. Includes FE and post 16 learning in schools.
PLTS	Personal learning and thinking skills. First introduced as part of wider key skills on vocational courses and then as a requirement in Diplomas and Apprenticeship frameworks.
QAA	Quality Assurance Agency. Carries responsibility for quality and standards in the HE sector.
QCA	Quality and Curriculum Authority. Government body responsible for approving qualifications in secondary education and FE.
QCF	Quality and Curriculum Framework. Structure of credits and levels which all approved courses in FE are located in.
SASE	The Specification of Apprenticeship Standards for England was published by BIS, DfE and the National Apprenticeship Service following the Apprenticeships, Skills, Children and Learning Act.
SFA	Skills Funding Agency. Current government funding body for FE.

Chapter 1: Introduction

> *All teaching on the University level (and if possible below) should be training and encouragement in critical thinking.*
>
> *(Popper 1970: 53)*

1.1 Context

1.1.1 Conceptual, curriculum and policy considerations

The concept of critical thinking is a powerful signifier that permeates educational discourse in curriculum, policy and philosophical contexts. It has been strongly associated with the nature and purpose of higher education (Barnett 1997) and is embedded in curriculum design and assessment protocols across this sector (Johnston *et al.* 2011: Ch.5). It has also been at the heart of thinking skills programmes for schools in the US and UK (Lipman 2003, McGregor 2007). Following the government commissioned McGuiness Report *From thinking skills to thinking classrooms* (1999), it was included in the 'skills across the curriculum' of the UK National Curriculum in 2000, then further consolidated with the 2008 revisions. Critical thinking gained increasing prominence in the post compulsory education and training (PCET) curriculum with the establishment of a "framework for personal, learning and thinking skills [PLTS]…embedded in the programmes of study" (QCA 2008b) of the new Diploma qualifications aimed at providing vocationally relevant learning for 14-19 year olds, and the subsequent inclusion of PLTS in new Apprenticeship frameworks under SASE regulations (BIS 2011). It has been identified as part of a 'skills deficit' in current A levels in research set up to inform the recent consultations on A level reform (Hignet *et al.* 2012). Critical thinking as a separate subject option has become established in the A level curriculum since the introduction of an Advanced Supplementary (AS) level with the 'Curriculum 2000' changes, followed by a full A level in 2006. It is as an A level that critical thinking has been most clearly defined, delineated and established in the mainstream of the post 16 curriculum in the UK and it is this which provides the main applied focus of the thesis.

Critical thinking has been advocated as an active counterpart to what Dewey called "uncritical thinking" (2007: 10), with its dependency on habitual ways of thinking which limit our understanding and restrict our effectiveness as problem solvers and our autonomy as decision makers. It is needed to avoid the "inertia that inclines one to

accept suggestions at face value" (Dewey 2007: 10), encouraging supplication to tradition or the will of the powerful. It is seen as essential to the operation of reason and reason as the core purpose of education (Scheffler 1973, Siegel 1988). Different definitions of critical thinking emphasize reasoning skills of analysis and evaluation, dispositional factors, problem solving or decision making (Fisher 2001: Ch.1, Moon 2008: Ch.3). It is a contested concept both referentially and in terms of pedagogical prescriptions (Walters 1994, Winch 2010). A key unresolved debate concerns whether it is best conceived as a generic 'toolset' for assessing reasoning and evidence, which can and should be taught in its own right as a set of skills independent of the content of other subjects (Ennis 1987, Siegel 1988); or as a facet of field specific conventions for establishing the warranty for propositions and beliefs, which can *only* be developed in the context of particular disciplines (McPeck 1981, Toulmin 2003). One of the aims of the thesis is to clarify the nature, scope and epistemological underpinnings of the concept of critical thinking in order to understand how it has been realised in its A level form. This is the main focus of Chapter 3 of the thesis.

The "received model of critical thinking" in the schools and further education sector focuses on the "analytical, abstract, universal and objective" application of skills (Walters 1994: 1) and has engendered controversy in the public domain. It has been rejected by populist detractors such as Chris Woodhead, former chief inspector of Ofsted, who advised a parent that "there is no need for any A level student who is being taught properly to waste time on a separate critical thinking AS level" (Sunday Times 7.11.10), and by a range of academic critics such as Johnson, who claims that "treating thinking as a skill is based on serious and educationally damaging misconceptions" (2010: 2). This in part results from the problematic notion of thinking *skills,* especially when conceived as generic skills which can be abstracted from context, and furthermore

> *Teaching thinking can lead to knowledge playing a subsidiary role and even being seen as an impediment…the disparagement of knowledge, the impersonalising and neutralising of thought, the neglect of truth, and the computerization of thought.* (Johnson 2010: 2)

This depiction of critical thinking as anti-knowledge features explicitly in Furedi's polemic on 'why education isn't educating' (2009) and is given a thorough theoretical grounding in the curriculum theory of Young and the social realist school in the sociology of knowledge (Young 2008, Maton and Moore 2010). For these writers thinking skills programmes are associated with the increasing prevalence of genericism as a feature of curriculum policy and practice which has accompanied an 'evacuation of knowledge'. This appears paradoxical when it is recognised that for proponents of critical thinking it is axiomatic that

it is inextricably bound up with knowledge: whatever the variations in definition of critical thinking, the core purpose of it is to provide a means of testing the warranty for belief and therefore it is essential to the establishment of knowledge (Siegel 1988: 53). A further aim of the thesis is to explore and seek clarification of the apparent oxymoron of an 'anti-knowledge' thesis applied to critical thinking. This is a main focus in the discussion in Chapter 6.

1.1.2 Biographical influences

Critical thinking is a concept I encounter and engage with directly in my work as a lifelong learning manager and lecturer in a further education (FE) college. The development of the thesis combines a personal journey with a public exploration of issues through the assemblage of texts and evidence drawn upon, juxtaposed and critiqued. The research questions addressed therefore represent an attempt to resolve issues relevant on both a personal level and in terms of academic debate.

I have taught Critical Thinking at a further education (FE) college since its inception as an AS level subject. I came to it with a spirit of curiosity and an expectation that it would connect with the critical approach I had fostered over a long teaching career with Sociology students. Like many of those teaching Critical Thinking (Black 2009a: 17), I had no prior specialist subject grounding. Through peer support, reference to recommended texts and use of awarding body materials I acquired a working knowledge of it as a set of skills tested in particular ways in an examination. I attended several professional development events in the subject which focussed largely on 'honing the skills', with an emphasis on the kind of behaviours needed by students to satisfy the assessment requirements, or on pedagogical strategies such as how to contextualize and stimulate practice in the skills advocated in an interesting and relevant way. There was minimal explanation of the origins and derivation of the subject at these events, though brief reference to the influential work of A. Fisher (2001; 2004) and an occasional quote from Dewey hinted at a historical lineage to the concept (Butterworth 2006 & 2008). At one event (Butterworth 2006) an introductory activity involved critical engagement with the nature of critical thinking through discussion of an article by Furedi (2004) which attacked the critical thinking movement for its formulaic approach. This was analysed and evaluated using the tools of critical thinking and despite its apparently flawed reasoning, this article had a certain resonance, articulating some of my own emerging concerns.

I had developed a progressive sense of unease with what seems if not a vacuous activity then certainly a denuded one. In the tasks students complete, argument elements may be correctly identified and described, flaws uncovered and analogies evaluated, yet it

feels as if this occurs in a vacuum. In Bernstein's terms there is an "emptiness to the concept" (2000: 59). It has become a self referential activity, assumed to be valuable in and for itself. The problem goes beyond the pedagogical question of whether critical thinking skills are best taught on a discrete basis or contextualised in other subjects: it is also a matter of the scope and depth of the critical process. By focussing on formal operations in the construction and assessment of reasoning, described by Walters as a 'logicistic' approach (1994: 1), there is an alignment with technical rationality and positivistic notions of objective knowledge testing and creation (sections 3.2.3/4). A reified notion of generic critical thinking skills may or may not closely match the criteria for relevant and effective critical analysis amongst the community of practitioners in a particular discipline: it is questionable whether purposeful critical thinking can be separated from the conceptual and theoretical understanding assumed in different forms of knowledge. Furthermore, from a sociological standpoint, surface description and evaluation of the steps of reasoning may miss altogether issues of underlying values and ideological frameworks:

> *Styles of thinking as well as ideas themselves are inextricably connected with broader, more complex environments of discourse, place, time, value, and worldview, and to neglect these environments is to limit the function and range of thinking in an unwarranted way*. (Walters 1994: 16)

The question of what critical thinking is *for* also arises when considering the free standing AS/A level qualification (section 5.2). The leading examination board for the subject (OCR) publicized a conference on Successful Thinking Skills For All to be held on 27 January 2009 at the same time it released a news story which claimed research had shown a "dramatic improvement" in overall A level performance for those studying Critical Thinking as part of their programme, notably for those achieving top grades (OCR 5 December 2008). In this coincidence of references it is possible to see tensions between critical thinking as something all learners should develop as part of their educational experience and as something that enhances and endorses access to higher level qualifications and elite professions; and between critical thinking as an educationally valuable end in itself (as part of cognitive, personal and social development) and as a means to other ends in terms of performance enhancement (section 5.2.4).

1.1.3 Overview of literature

There is an extensive body of literature on critical thinking, including theoretical and conceptual treatises, reports on research in educational contexts and applied skills manuals. Indebtedness to Dewey is evident across the strands of literature, whether explicitly acknowledged (A. Fisher 2001: 2; Quellmalz 1987: 87; Lipman 2003: 34-38) or

implicitly referenced (Brookfield 1987). This suggests a common philosophical underpinning to concepts of critical thinking based on Dewey's notion of reflection as counterpart to 'uncritical thinking' (Dewey 2007: 10). This in turn can be traced back to Enlightenment philosophers such as Bacon and links closely to positivist and fallibilist notions of science prevalent in the early 20th century, as well as to the ancient Greek philosophers and the tradition of rationalism. However, despite this common heritage, there has been a proliferation of definitions of critical thinking and much of the literature contains exposition and critique of different positions, particularly between exponents of the informal logic movement and its critics, encapsulated in the recent dialogue between Johnson and Siegel (Winch 2010). In addition the concept has been criticised as too narrow, with a broader notion of criticality proffered by Barnett (1997) and a wider range of thinking skills and qualities advocated by 'second wave' writers (Walters 1994). The omission of concern for 'ends' as well as 'means' has been highlighted by Barnett (1997: 3) and points to the need for ethics to be considered alongside logic for critical thinking to be purposeful and beneficial. Lipman notes the deficiencies and loss of momentum of the critical thinking movement in the 1990s and sets out a conception of thinking skills which encompasses creative and caring thinking as well as critical thinking (2003: Ch.11 & 12).

Lipman (2003) suggests that the concept has become disconnected from its philosophical roots, with its descriptive referents (mostly sets of skills and dispositions) removed from its epistemological base. There is also a lack of clarity on the issue of age appropriateness of educational interventions to promote critical thinking, with writers such as Moon (2008) equating critical thinking capability specifically with experience in higher education, whilst others suggest an early or even pre-school programme (R. Fisher 1990, Costello 2000, Lipman 2003). The plethora of conflicting positions amongst the academic community renders problematic the policy goals of critical thinking and leaves practitioners directionless (Lipman 2003: 2), resulting in meaning being sought in an instrumentalist, syllabus driven pedagogy.

Following a series of educational policy reviews in the United States, critical thinking was placed in the vanguard of attempts to move the curriculum away from an information giving model to one in which inquiry and reasoning skills would equip learners better for the challenges of higher study and the demands of living in the modern world (Lipman 2003: 28-31). As a consequence there was extensive research and literature on critical thinking in the 1970s and 80s (Cassel and Congleton 1993). Much of this work was concerned with identifying criteria and methods for assessing critical thinking skills and the impact of different pedagogical strategies. In the UK three main strands of literature emerged in the wake of the US debates. A series of publications have concentrated on the nature of critical thinking skills and how they can be applied in different contexts (A.

Fisher 2001, van den Brink-Budgen 2001, Butterworth 2005, Cottrell 2005, McGregor 2007). The second strand offers a more conceptual and argumentative discussion of the significance and adequacy of critical thinking in defining the nature and purpose of higher education (Barnett 1997) or adult learning (Brookfield 1987). A third strand has emerged which recreates the earlier US emphasis on impact studies; in the UK this is particularly associated with the work of the Centre for Learning and Teaching (CfL&T) at Newcastle University (Higgins 2004, 2010). In addition a number of government commissioned reports have provided overviews of curriculum models for critical thinking and their potential benefits (McGuiness 1999, Livingston *et al.* 2004, Moseley *et al.* 2004).

The literature on critical thinking and education has been dominated by the disciplines of philosophy and psychology. Philosophical analysis has gone some way to articulating differing conceptions of critical thinking (McPeck 1981, Siegel 1988, Lipman 2003) and philosophical processes, notably informal logic, have directly informed accounts of how reasoning skills can be identified and developed (Scriven 1976, Toulmin 2003, A. Fisher 2004). Psychological approaches have sought to link capacity for critical thinking to stages of intellectual development or problem solving models (Quellmalz 1987: 88, Johnston *et al.* 2011: Ch.3) and have generated a plethora of empirical studies to identify and test skills (Cassel and Congleton 1993, CfL&T). Overt sociological analysis has largely been absent from the debate, though a current running through much recent work implies a strong association between critical thinking and the characteristics of a late modern world (Brookfield 1987, Barnett 1997). Sociological approaches to the curriculum (Kelly 2004, Young 2008, Maton and Moore 2010) open up a potentially fruitful perspective on the significance of the emergence of critical thinking. This thesis takes a multi-disciplinary approach and seeks to connect up debates from within the fields of philosophy and psychology about the nature of critical thinking and its relationship to epistemology with sociological models of the curriculum and knowledge.

1.2 The research problem

1.2.1 Formulating the problematic

Biographical reflection, overview of literature and consideration of policy context led to identification of a number of problematic issues concerning the meaning and application of the concept of critical thinking in the context of the UK curriculum. These include conflicting views on the age appropriateness of the teaching and development of critical thinking; differences on whether it is essential for all or aimed at the highest achieving; an

apparently contradictory situation in which critical thinking is highly valued within higher education, yet there is inconsistency in the policies of universities towards acceptance of an A level in it as an entry qualification; the establishment of an A level in critical thinking founded on a model of universal reasoning, which omits any recognition of alternative approaches; the "never ending story" (Sternberg1987: 254) of competing generic and field specific concepts of critical thinking that is "going nowhere" (Barnett 1997: 64); the apparent paradox of critical thinking being defined in terms of its function in establishing and checking knowledge yet being associated with 'anti-knowledge' trends in the curriculum by recent social realist commentators (Young 2010a,b; Furedi 2009).

At the heart of most of these issues and central to the thesis is the relationship between critical thinking and knowledge. The thesis entails a sustained epistemological exploration: it considers the assumptions about the production of knowledge that lie behind different concepts of critical thinking, including that of the A level, and those that underpin the analytical frameworks of curriculum theories that offer interpretation of the significance of critical thinking in the curriculum. In particular the thesis seeks to resolve the paradox of critical thinking as anti-knowledge by noting that the pertinence of this attributed effect depends on what assumptions are made about the pedagogical and epistemological form that critical thinking takes. It is suggested that the approaches to the curriculum identified by Young can be applied in a more differentiated way to critical thinking. Furthermore it is proposed that the social realist approach to the curriculum advocated by Young, Maton, Muller and Moore, is compatible with and would benefit from inclusion rather than rejection of critical thinking if it is conceived in a field dependent form as advocated by McPeck (1981), Bailin *et al.* (1999) and Johnston *et al.* (2011). The thesis is developed by drawing on the empirical research undertaken and making connections to Pawson and Tilley's (1997) emphasis on context in a realist methodology. This involves recognition that study of critical thinking occurs in the context of students' wider learning programmes and life experience.

1.2.2 Aims

The aims of the thesis are

i. To explain the derivation of the concept of critical thinking and to identify major variations in its usage.
ii. To clarify the nature of the concept which underpins the A level in Critical Thinking.
iii. To describe and critically assess sociological theories of the curriculum which provide frameworks for interpreting the significance of critical thinking and apply these to A level Critical Thinking.

iv. To develop a more refined and extended theoretical account of the relationship between critical thinking and the knowledge curriculum.
v. To give voice to participants in A level Critical Thinking in the discussion of its value and significance.
vi. To make explicit connections across disciplines, adding approaches from the sociology of knowledge to philosophical, psychological and educational studies
vii. To raise issues about higher level skills at A level that are relevant to the forthcoming review of A levels in the UK.

1.2.3 Research questions

The following core and subsidiary research questions have been identified out of the biographical concerns, literature review and theoretical reflection described. They are returned to in the discussion (Chapter 6) that follows the report of findings from primary research (Chapter 5).

1. What is the concept of critical thinking that underpins its realization as an A level?
    i. How does it relate to variations in the way the term is used in academic literature?
    ii. What is the conception of knowledge reflected and represented?
    iii. What are the pedagogical implications?
2. How can the significance of critical thinking be interpreted in curriculum theory?
    i. What is the interpretation offered in progressive liberal and social realist theories?
    ii. How can Young's social realist analysis be extended and refined to provide a more differentiated analysis?
3. To what extent do participant views and experiences support the representation of critical thinking in the curriculum theory of Young and Furedi?
    i. How do judgements on the value of critical thinking compare?
    ii. What is suggested about the relationship between critical thinking and the knowledge curriculum?

1.2.4 Significance of the study

It is anticipated that the outcomes of the research will be of direct relevance to both the academic community and to curriculum policy makers. In bringing a sociological approach to bear on the meaning and function of critical thinking in the A level curriculum, I hope to demonstrate the value of multi disciplinary dialogue as advocated by Habermas and critical theory (Habermas 1988: 3). In revisiting debates about the nature of critical thinking, the thesis adds to existing knowledge by paying explicit attention to the different epistemological positions that underpin conceptions of critical thinking. A unique focus of the thesis is provided through an extended, yet critical, application of the work of Young (2008) in order to illuminate the place and potential of critical thinking in the curriculum, both extant and prospective. The issues raised have current policy applicability given the 2012 launch of proposals to reform A levels by Michael Gove, Minister for Education (Ofqual 2012).

The thesis also has relevance for practitioners in providing an exposition of the taken for granted origins of the A level form of critical thinking. It contributes a knowledge base that should help non-specialist critical thinking teachers to understand the rationale, focus and scope of the subject that lie behind the processes and skills taught. It provides a theoretical basis for choices about a thinking skills curriculum and pedagogy, including decisions on whether and how to run discrete critical thinking courses such as A level. It is also of relevance to those responsible for making associated curriculum management decisions regarding the use of standalone or integrated delivery models, and regarding the kind of staff development which is necessary to support this.

1.3 Structure

1.3.1 Framing the research: content and method

It was anticipated that practitioner views on their experiences should form part of the research so that participant meanings could be compared with academic and policy definitions and the claims made by curriculum theorists. A connection was noted between this way of conceiving of the problem and a framework used by Evans' (2003). The distinction Evans makes between policy espoused, enacted and experienced was adapted to provide a framework for organising the substantive content, the different research strategies and the analysis of findings in this study.

Evans' classification is a modification of that offered by Argyris and Schon (1974) as a tool for analysing the way organisations are managed and run. Argyris and Schon

distinguish between theory espoused and theory in use. The former refers to the theories that professionals overtly subscribe to, while the latter concerns theories that can be inferred or reconstructed from what they actually do in practice:

> *espoused theory…is the theory of action to which he gives allegiance, and which, upon request, he communicates to others. However, the theory that actually governs his actions is his theory-in-use, which may or may not be compatible with his espoused theory.* (Argyris and Schon 1974: 7)

As Argyris and Schon indicate there is no guarantee that the theory espoused will be reflected in pure form across all aspects of an organisation's business: theory in use may deviate from or even conflict with theory espoused.

Evans suggests the term policy espoused when considering national and global systems and policies on education. Policy enacted is found at the institutional level of policy implementation, in which the 'career trajectories' (2003: 419) of senior managers usually align them with the agenda and policy of external agencies: in this context this includes government departments and funding bodies such as DfES/DCSF/DfE, BIS and LSC/SFA. The final tier of Evans' framework, policy as experienced, involves "investigation of learners' and teachers' experiences" (p.416) to gain a full appreciation of the impact and import of policy in people's lives. Although Evans' emphasis is on how the wider system and policy issues are worked through at the local and individual level, it nonetheless opens up the potential to identify discrepancies between policy espoused and policy enacted and also between each of these and policy experienced. Elements of Evans' and Argyris and Schon's frameworks have been incorporated into an analytical tool which captures variance in the fields of meaning encountered in the discourse of critical thinking. A diagrammatic overview is given in figure 1.1.

Evans chose the term *policy* espoused in preference to Argyris and Schon's *theory* espoused in the context of reflection on comparative research on education. Both terms are proposed here, with a distinct meaning of *theory espoused* suggested. This is taken to refer to academic definitions and descriptions of the nature of critical thinking, which may or may not be consistent with use of the term in policy espoused. A major focus of the research is on exploring the derivation of the concept of critical thinking and the variations in its definition, and in laying bare its epistemological underpinnings. Theory espoused is itself a contested domain and this is reflected in the exploration and critical review of literature captured in Chapter 3.

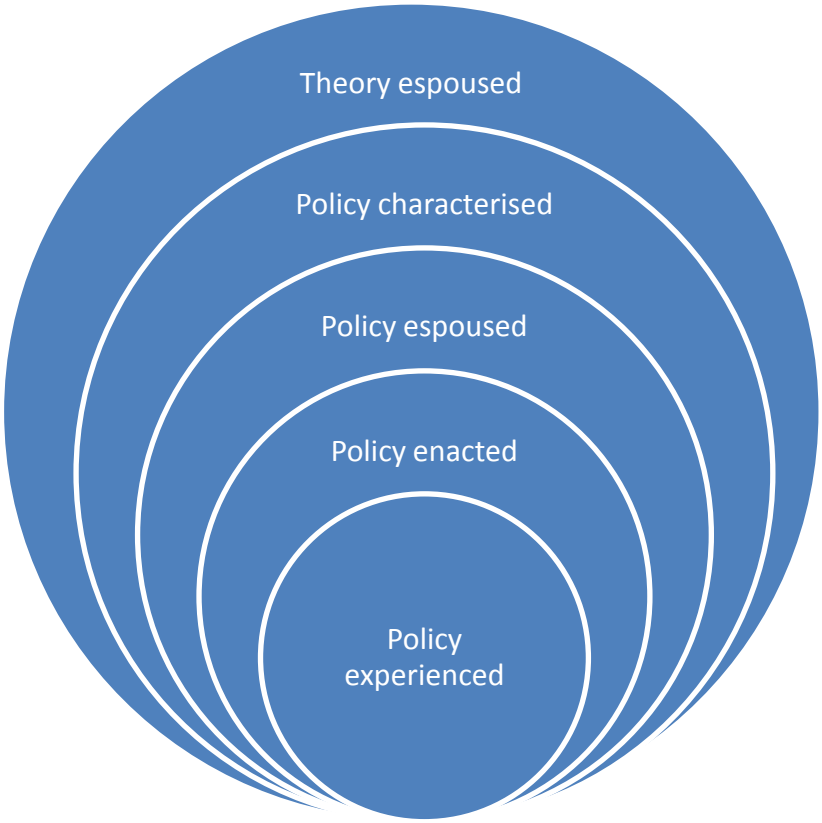


Figure 1.1 Layers of analysis, adapted from Argyris & Schon (1974) and Evans (2003)

In this research, the concept of *policy espoused* is deployed to describe the way that critical thinking is portrayed in official publications and policy documents as they contain the rationale for its inclusion in the curriculum and the claims made for it. Hence attention is given to documents which set out the purpose of curriculum initiatives approved by the government and to the claims of awarding bodies that promote critical thinking as an A level subject (section 5.2). In addition to official statements, however, alternative accounts of policy offered by curriculum theorists (Kelly 2004, Young 2008) are central to the analysis. These are distinguished here as *policy characterized* and are compared with policy enacted and experienced (Chapter 2, section 5.4).

Policy enacted relates to the realisation of policy espoused through the formal curriculum structure and content in the syllabus of courses called Critical Thinking; together with the presentation of the subject in recommended texts and the organisation and methods of teaching and assessment in practice. Material of this kind is referred to alongside policy espoused in section 5.2.

Policy experienced refers to how those studying critical thinking programmes understand and feel about their experiences, how they view the learning taking place, what they see as the value and scope of it. This concerns the effects of policy enacted and how well this matches the goals of policy espoused. It is the main focus of investigation using

primary methods of research, with the report of findings on participants' views in section 5.3.

Use of this framework aided the selection and cross relating of literature in the development of the thesis, as illustrated in figure 1.2. The categories provided a means of organising types of literature and subsequent searches. They can be seen as clusters of literature, with relationships to be mapped *within* each, and crucially *between* each. The synthesis of material from different traditions, as represented by the connecting circle, is a distinctive feature of the thesis.

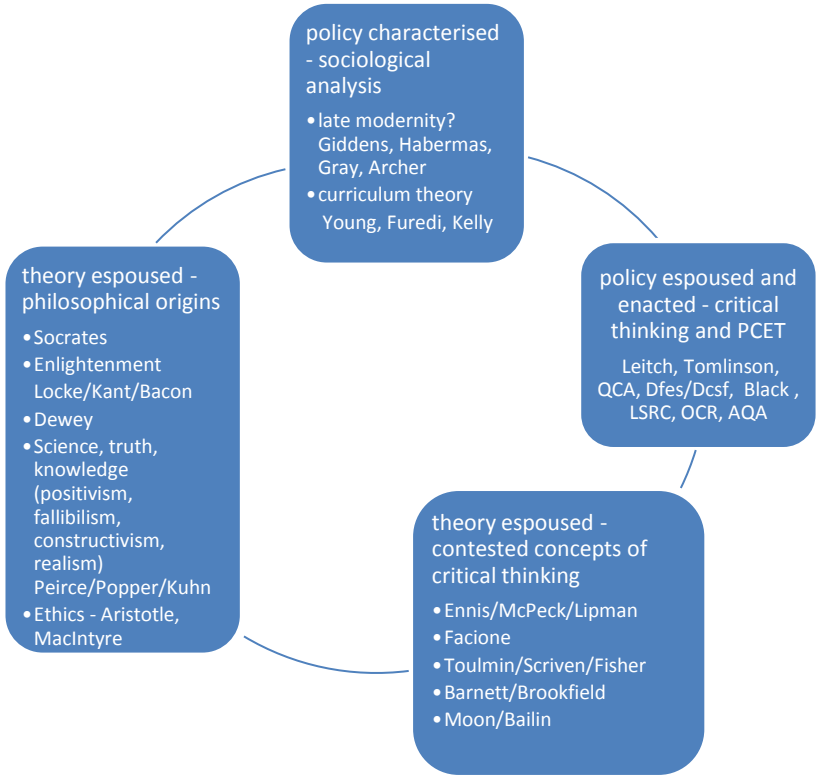


Figure 1.2 Developed literature map

1.3.2 Thesis outline

The main thread of the thesis is conceptual and therefore the literature review contained in Chapters 2 and 3 is especially important as the accounts of various authorities are themselves the object of analysis, synthesis and critical evaluation.

Chapter 2 establishes the theoretical context of the thesis by introducing curriculum theories which focus on the relationship between knowledge and recent educational policy and practice in the UK. Progressive liberal (Kelly 2004) and social realist (Young 2008, Furedi 2009, Maton and Moore 2010) models are compared and contrasted and the place of critical thinking in their analyses is explained. Their contrasting views on the

desirability of a skills based approach to critical thinking in the curriculum are highlighted. The chapter includes critical reflection on the assumptions and preconceptions underlying each approach and concludes that the social realist approach offers more potential as a framework of interpretation applied to critical thinking in the curriculum.

Chapter 3 explains the historical and philosophical basis of variations in the concept of critical thinking and enables the character of A level Critical Thinking to be positioned in relation to this genealogy. The conceptual and theoretical analysis begins with an exploration of the place of Dewey's work as the key link between classical philosophy, from Socrates to the Enlightenment, and contemporary approaches in the critical thinking movement. Underlying epistemological assumptions are examined by focussing on the relationship between Dewey's concept of reflection and notions of science; seeking to position his work in relation to positivist, fallibilist, constructionist and realist conceptions. The relationship between critical thinking and alternative propositional or procedural conceptions of knowledge is also considered. The main variants in the deployment of the concept of critical thinking post Dewey are then considered. This includes a range of applied approaches within the influential informal logic movement, such as Scriven, Ennis and Fisher. McPeck's (1981) rejection of critical thinking genericism and orthodoxy is explained and the epistemological challenge his work offers is highlighted. The connection between this approach and Toulmin and hence to the social realist conception of knowledge is noted. Wider concepts of critical being are considered from the work of Paul and Elder, Brookfield and Barnett. The connection made between late modernity and critical thinking in recent writing is noted. I refer to Moon's (2008) attempt to 'map the conceptual territory' of critical thinking and from a critique of this go on to suggest a different schemata which highlights both fundamental epistemological assumptions and pedagogical implications.

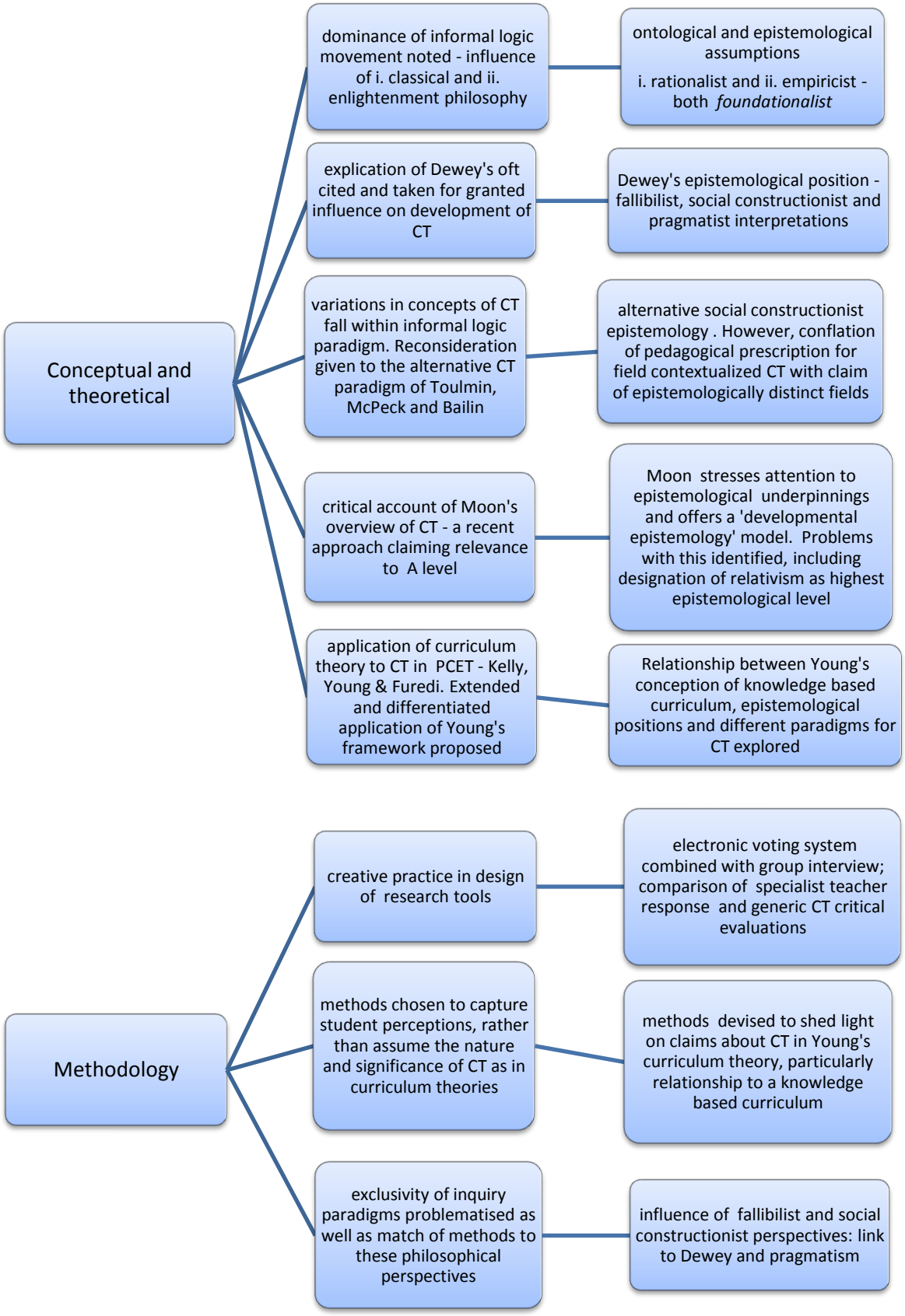
Chapter 4 explains the distinctive features of the research design, *viz.* adoption of a social constructionist perspective in a qualitative approach designed to discover the meanings practitioners attach to the central concept; differentiation between the relativist approach of constructivism and a realist compatible social constructionism; comparison of the methodology adopted with Dewey's pragmatism to illuminate epistemological and ontological orientations. The choice of research strategy and methods is explained in realist terms based on pragmatic choices. The primary research involved an instrumental case study using a mixed method approach and based on a purposive sample of students of A level Critical Thinking in an FE college. The strategy adopted was designed to enable participants to clarify and construct conceptions of critical thinking whilst also raising aspects of the impact of studying Critical Thinking on learning and behaviour, following Kirkpatrick's framework (2006). A supplementary method used a text response activity conducted with a sample of specialist staff teaching a range of A

level subjects in another FE college in order to gauge subject expectations regarding critical evaluation skills.

Chapter 5 provides background on policy enacted in A level Critical Thinking and situates it in relation to the conceptual overview given in Chapter 3. It includes analysis of the findings of the primary research undertaken into policy experienced. These findings are intended to illuminate issues and problems identified in the theoretical and conceptual analysis: they are not the end point of the research but rather provide a contributory voice which complements the overall analysis.

Chapter 6 reviews the original argument in the light of the analysis in Chapters 2, 3 and 5 through a discussion structured around the research questions. This involves synthesis of material from philosophy, policy and curriculum theory which are related to the primary evidence. I offer a multi-layered sociological interpretation of the place and significance of critical thinking in contemporary educational discourse, considering critical thinking in relation to curriculum policy and practice in PCET, to late modernity and to social conceptions of truth and knowledge.

Chapter 7 draws conclusions for theory and notes implications for curriculum policy. Recommendations are made which outline a concept of critical thinking underpinned by a social realist epistemology and set out the pedagogical implications of realizing such a model. The limitations of the thesis are noted and suggestions are made for future research.



Key: CT = critical thinking; PCET = post compulsory education and training

Figure1.3 Overview of distinctive features of the study

Chapter 2: Policy characterized: curriculum theory, knowledge and critical thinking

2.1 Introduction

One of the aims of the research is to develop a sociological approach to the interpretation of the significance of critical thinking in the contemporary UK curriculum. Two broad approaches are explored, applied and compared and contrasted in their characterization of policy; both directly address issues concerning the role of knowledge and skills in the curriculum and both purport to offer a critical analysis. The work of Kelly (2004) is considered as an example of a progressive liberal approach which has embraced the postmodernist tendency and is apposite given its influential standing in initial teacher training courses and its affinity with recent policy changes such as the 2008 14-19 reforms (Dcsf). The approach of Young and the social realist school of thought (Maton and Moore 2010) is then given prominence because of its engagement with issues pertaining to the place of knowledge in the curriculum and its discussion of the impact of skills driven educational policies. In each case the theoretical models put forward offer a fruitful framework for interpreting the significance of thinking skills in the curriculum. The work of Furedi (2009) is considered alongside the realist school as it has some commonality with the position of Young and, whilst more polemical in tone, makes specific reference to critical thinking in its analysis.

2.2 A progressive liberal approach

Kelly is a longstanding champion of the kind of 'childcentred' approach to education that is associated with a progressive liberal approach that can be traced back through Dewey to Rousseau. This school is characterised by its emphasis on experience rather than knowledge transmission as the starting point for curriculum organisation and pedagogy. In recent updates to his work Kelly (2004) has celebrated the growth in influence of postmodernism as a logical extension of this approach, an alignment which is also recognised in social realist critiques of this tradition which link it to a 'social constructivist' lineage (Young and Muller 2010).

2.2.1 Kelly's 'ideologies of education'

Kelly's work on the curriculum in the formal education system in the UK provides a useful starting point in interpreting the significance of critical thinking. Kelly claims that there are two established and competing ideologies of education that have underpinned shifts in policy and practice and offer different prescriptions for curriculum planning: one sees "curriculum as content and education as transmission" and the other "curriculum as

process and education as development" (2004: 58). He suggests that these have been supplemented by an "aims and objectives" approach which has become increasingly prominent since the 1960s.

Kelly is critical of the notion of education as transmission of content based on 'inherited wisdom or canon' enshrined in syllabi. He depicts this as a model of the curriculum which treats knowledge as a static and absolute entity, with learners assuming the role of 'empty vessels' to be filled up with the accepted wisdom. Growth of understanding and critical awareness is simply an assumed by-product of exposure to subjects. Kelly sees this assumption as unfounded and in this respect his position is akin to that of those in the critical thinking movement who argue that critical thinking does not automatically accompany subject transmission, but requires separate dedicated programmes (A. Fisher 2001, Smith 2002, Higgins 2010). Kelly claims that this ideology of education is underpinned by an "absolutist epistemology" (2004: 47) that starts from the premise that there is a fixed body of objective knowledge that it is valuable for students to acquire. Kelly is sceptical about the basis for determining what constitutes worthwhile knowledge and critical of the potentially alienating effect of forcing learners to acquire cultural knowledge they may not relate to. He also argues that it is against the spirit of 'emancipatory knowledge' (Habermas 1971), based on open and critical dialogue, as it leads to curriculum practice which has no place for critical voices that can and should be heard in a free democracy, and that it can offer no indication of the aspects of disposition and attitudes we would wish to encourage through education. It is a model of the curriculum which is antithetical to that of critical thinking theorists who stress the importance of critical dispositions both to individual development and to the healthy operation of democracy (sections 3.3.3/4)

Kelly suggests that official education policy in the UK in the late twentieth and early twenty-first century "can be seen as attempts to conflate the traditional model of curriculum as content with that model which emerged with the aims and objectives movement" (2004: 56). The aims and objectives approach is seen to stem from a scientific - technical ideology which attempts to define the purpose of educational activity in terms of specific targets and to measure success in achieving them. This is evident in the testing culture promoted by successive governments in conjunction with regulatory bodies such as Ofqual and Ofsted. Targets have become ends in themselves, begging the question of what educational principle is served in pursuit of them. Kelly cites the influence of behavioural psychologists on this approach and mentions Bloom's taxonomy as an example of an attempt to impose measurable categories on stages of learning. This has led to a linear view of progress up a hierarchy of competencies. In Kelly's characterization of this approach, education is reduced to instruction in and acquisition of

skills, from basic literacy and numeracy skills onwards, an approach which loses sight of the purposes behind the acquisition of skills. The rationale for and public justification for critical thinking in the curriculum can appear to embody this aims and objectives ideology, with emphasis placed on how skills acquired can equip learners for further study or employment and how they can benefit performance in other subjects (section 5.2.4. and Black 2009b). This echoes Barnett's critique of the 'critical thinking industry' which has positioned it as a set of transferable skills which appear to serve purely instrumental ends rather than serving a higher purpose such as personal or social liberation. Barnett notes that absence of an explicit educational rationale leaves critical thinking open to being used for various ends which suit vested interests "critical thinking is heralded as a key component of the competencies needed for economic regeneration. The corporate world needs to move on and we need critical minds to help it do so" (1997: 3). Instrumentalism is viewed as "inimical to educational provision in the full sense" (Kelly 2004: 68).

Kelly characterises contemporary UK education in terms of a knowledge transmission model which is overlain by scientific measurement. He argues that essential elements of the education of the person are underdeveloped, such as aesthetic appreciation, development of social responsibility and the growth of genuine critical sensibilities. His preferred ideology of education is a person-centred developmental approach and

> *begins from a view of society as democratic, of human beings as individuals entitled within such a society to freedom and equality and of education as to be designed and planned in such a way as to prepare and empower such individuals for active and productive life within a democratic social context.* (2004: 77)

Like the critical thinking movement from Dewey onwards (section 3.3), this view of education is "firmly rooted in a concept of social democracy" (2004: 77). For Kelly this entails a commitment to personal autonomy in decision making and choices

> *to become as fully autonomous as possible as a human being, one needs to develop the greatest possible depth and breadth of understanding…the capability to look critically at the world…to develop the ability to make up one's own mind about many aspects of that world.* (2004: 85)

These views are clearly aligned with the role attributed to critical thinking by Paul and Elder and others (sections 3.3.3/4). Kelly's reference to the "capability to look critically…" is consistent with the case made for developing critical thinking *skills*, while he goes on to recognise the importance of *disposition* "the content of the curriculum… must be presented in a manner which promotes critical consciousness and invites critical reflection, personal response, even rejection" (2004: 85). Kelly's preference for experiential, student centred and activity based learning is essentially Deweyan as is his

claim that “the process and the goal of education are one and the same thing” (2004: 82). The teaching of critical thinking, appropriately realised, would appear to be both desirable and necessary to this educational enterprise.

While Kelly does not write explicitly and specifically about the role of critical thinking in the curriculum, his rejection of a skills training approach to education supports the case of those who criticise a ‘skills and drills’ approach to teaching critical thinking. However, the ideal of critical thinking at the heart of personal and social development, as put forward by Paul and Elder (2002) and developed more fully in Barnett’s (1997) concept of criticality, is well matched to Kelly’s model of a process based curriculum. There is a clear affinity between this and the role expected of thinking skills in the holistic approach to learning advocated in the rationale for the 14-19 Diplomas (QCA 2008a: 5-9) and summed up, using Kelly’s terminology, on a professional development website: “teachers, departments and schools have seen the recent changes [implementation of PLTS] as a licence to place more attention on the *processes* of learning and not just the *products*” (Teaching Expertise 2007, researcher’s italics).

2.2.2 Critical reflections on Kelly’s position

Kelly’s theory could be taken as a legitimising framework for particular concepts and realizations of critical thinking. However, there are a number of problems with his analysis. In characterizing all models of the curriculum as ideologies, he provides no grounds for differentiating between them and arriving at his preference for the process model. He offers a crude dichotomy in counter posing ‘process’ and ‘content’ led curricula, when there is a high degree of mutual interdependence between them, just as there is between procedural and propositional forms of knowledge (Walsh 1993: 139). The notion of a process based curriculum rests on an idealisation of personal freedom and democracy (what Gray calls “abstract individualism”, 1995: 8) that leaves a ‘de-socialised’ concept of choice: the absence of acknowledgement of the impact of socio-cultural influences echoes that of the ‘generic skills’ approach to critical thinking of the informal logic movement (section 3.3), for which reason might be said to operate ‘in a vacuum’. Kelly’s picture of a content led curriculum is also problematic given its simplistic equation of knowledge with information and it can be contrasted with Young’s (2008) framework of analysis. This is consistent with Kelly in its depiction of the instrumentalism of the aims and objectives approach, but departs markedly in the description and value judgements made concerning knowledge or process driven curricula. Where Kelly sees the continuing influence exerted by a knowledge transmission ideology, Young argues that a knowledge vacuum is being created. While Kelly criticises this ideology on the grounds that it reduces learning to acquisition of information, Young stresses the

importance of maintaining and developing a knowledge focussed curriculum. The crucial difference between them rests with the representation of a knowledge based curriculum: for Young knowledge provides a set of conceptual and theoretical tools for enhancing our understanding of the world and takes us beyond the unmediated experiences of everyday life, while for Kelly it is dismissed as a pool of irrelevant and potentially oppressive facts. Young disputes the passivity of learners typically presupposed by critics of knowledge transmission, stressing that 'transmission' is an active and "complex pedagogic process in which a learner's everyday concepts are extended and transformed by theoretical concepts" (2012a: 147). Young sees the emergence of trends indicative of a process approach to learning as prioritising personal experience and undermining a knowledge based curriculum, whereas Kelly advocates commitment to and realisation of a process curriculum that has to date been squeezed out by the other ideologies. Young presents a different, richer, picture of what knowledge entails to Kelly, but retains the dichotomous distinction between knowledge and process based curriculum.

2.3 Young and the social realist approach

Young's central thesis is that, despite the common exhortation to prepare students for participation in 'a knowledge society' (2010a), both curriculum policy and sociological analysis have been characterised by the removal of knowledge as a central concern of education. He suggests that "recent curriculum reforms are leading to a reduction or even an 'evacuation of content'" (2010b: 21), a description taken up in Furedi's (2009) polemic on "why education isn't educating". Young claims that serious attention to knowledge has been written out of the sociology of education, which if it "is not to be vacuous … must include rather than try to wish away the centrality of epistemological constraints" (2008: xvi). This section begins with an exposition of Young's social realist analysis of recent curriculum policy and theory before going on to indicate how critical thinking can be interpreted in this analysis. It is embellished by reference to Furedi's work where this extends the analysis, and draws out further comparisons and contrasts with Kelly's work. A range of critical reflections on Young's analysis are introduced, proceeding to a critique of the limitations of his interpretation of critical thinking. Nonetheless it is argued that there is potential for a more developed interpretation of the position of critical thinking in the PCET curriculum based on a more extensive and differentiated application of Young's own framework.

2.3.1 How knowledge fell off the agenda

Like Kelly, Young suggests that recent curriculum policy can be characterised in terms of two contrasting ideologies (2008: 19). The first is 'neo-conservative traditionalism', an approach that takes for granted what constitutes worthwhile knowledge and places emphasis on the need to uphold traditional subjects and standards. Young suggests that this is embedded in much of curriculum practice and remains implicit until there are perceived threats to the established order. This was evident in media and political rejection of the 2004 Tomlinson report's recommendation for a diploma which would unify academic and vocational pathways and replace A levels, "which for neo-conservatives represent a 'Gold Standard' against which all other curricula must be evaluated" (Moore and Young 2010: 16). The second ideological position, which has become increasingly dominant since the Dearing reports of the late 1990s, is 'technical-instrumentalism', with its emphasis on the acquisition of skills to serve the needs of the economy. In this knowledge content barely merits attention as the preoccupation is with 'sector skills' and the 'level' of skills of the workforce (Leitch 2006; BIS 2009b, 2010). In the first approach learning is an end in itself, whereas in the second it is a means to an end. However, despite the differences between them, these approaches converge insofar as they both downplay the significance of questions of knowledge such as its derivation, significance and development. In the neo conservative traditionalist approach what counts as worthwhile knowledge is taken as a given as it is simply what is set out in the established curriculum. In the technical instrumental approach knowledge is subservient to performance outcomes or to vocational competencies and there is no acknowledgement of the creation and social significance of knowledge outside of the economic domain. Young's account of the two ideologies closely resembles Kelly's depiction of a content based curriculum supplemented by an 'aims and objectives' emphasis. However, for Young the problem with curriculum policy is the abandonment of knowledge, where for Kelly it lies in the prioritising of product over process. Kelly rejects a knowledge based curriculum *per se* while Young sees it as the very *raison d'être* of an education system. While both writers recognise that all knowledge has to be seen as relative to time, place and culture, for Kelly the implication of this is that the disputed territory of knowledge can never provide a sound basis for the curriculum whereas Young argues for a renewed focus on knowledge, albeit under a redefined social realist conception which recognises the socio historical context in which knowledge is produced and comes to be defined as worthwhile.

Furedi's distinctive contribution is to suggest that not only has knowledge been neglected but it has been replaced by an "anti-knowledge pedagogy" (2009: 180). He talks of the "psycho-pedagogy" (p.161) of learning styles, multiple intelligences, emotional

intelligence and 'personalised learning'. Although couched in polemical language, Furedi's scepticism is supported by Coffield *et al.'s* (2004) critique of the plethora of learning style inventories in use in PCET and their uncritical acceptance and advocacy. Furedi's association of such trends with the measurement culture of an outcomes driven model of the curriculum suggests an affinity with Kelly's critique of recent policy. However, the trends he criticises could also be interpreted as an attempt to implement the process ideology of education advocated by Kelly. Rather than seeing this as overlooked in curriculum policy as Kelly does, Furedi sees it as exerting growing influence at the expense of a focus on knowledge: "The minor status that pedagogy assigns to knowledge reflects the studied indifference that policy makes towards the intellectual content of education" (2009: 140-141). In Furedi's view focus has shifted from education to learning, with what is learnt being largely irrelevant and tied in to the mundanity of everyday experience. Like Young he decries the perceived failure to recognise the whole point of education as being to take people beyond their commonsense knowledge by giving them new conceptual tools and engaging them in ideas. This clearly conflicts with Kelly's view that understanding is tied to meaning acquired through experience, an approach which leaves no grounds for differentiating the everyday from educational knowledge. Furedi and Young depart from Kelly both in aspects of their interpretation of curriculum trends and in their view of what an education system should do. These differences are only partially explicable in terms of the educational sectors analysed, with Kelly focussing primarily on schools' policy and Young on PCET, while Furedi's assessment ranges across all levels from primary to higher education: more fundamentally they reflect differences in the writers' own values and beliefs concerning the nature and purpose of education.

2.3.2 Epistemological considerations

Young is critical of both of the main ideological positions which have dominated curriculum policy because of their inadequate treatment of knowledge. In the neo conservative traditional model knowledge is a 'given' which takes on an obdurate character, hypostasized in the formal curriculum and associated institutions. In technical-instrumentalism knowledge takes a back seat in a curriculum driven by measurable targets and outcomes. Until recently the main challenge to these ideologies has come from a range of perspectives which advocate the primacy of individual experience and the equal worth of beliefs held by all, especially those in less advantaged social positions. These include the progressive liberalism referred to above (Kelly 2004), the 'new sociology of education' (Young 1971), a range of poststructuralist approaches (feminist, multiculturalist) and especially postmodernism (Usher and Edwards 1994). Young claims that these recent forms of sociological analysis have conspired with policy trends in

leading to the evacuation of knowledge. He is critical of the impact of his own seminal work on Knowledge and Control (1971) which had emphasised the part played by power in the social construction of the curriculum. He describes the 'new sociology of education' as a social constructivist approach to educational and social inequality which emphasised processes of cultural transmission and cultural discontinuity between home and school. In this approach "the curriculum was seen as a site of political struggle" (Young 2008: 164) evident in competing definitions of what counted as worthwhile knowledge and in conflict arising through the delivery of the curriculum (Keddie 1971). Kelly endorses the view that "socially constructed knowledge is ideology and what is imposed through a politically controlled education system is the ideology of the dominant, controlling group" (2004: 32). Young, on the other hand, now accepts the thrust of criticism levelled at his work and argues that to see knowledge simply as a tool of dominant interests is reductionist as it conveys the impression that curriculum content is of no consequence in itself (2008: 164).

Young suggests that this was even more apparent in the postmodernist approaches to education which began to dominate curriculum theory in the 1990s, given the extreme relativist position taken on knowledge and truth (2008: 22). Kelly portrays the postmodernist turn as a logical extension of constructionism and approves of its questioning of claims on truth and rejection of 'totalising theories'. Moore and Muller note how the postmodernist position assumes correspondence between a particular model of knowledge as undisputable given, traditional forms of education and hierarchical social relations (2010: 62). Postmodernists differentiate themselves from this *socially* by adopting an ethical stance of alignment with subordinate groups, *educationally* by advocating more progressive curriculum and pedagogical forms and *epistemologically* by counterpointing relativism to the absolutist assumptions about knowledge they claim to be dominant both educationally and culturally. However, Young suggests that in the process of criticising the power of certain groups to set the knowledge agenda, postmodernists reduce all knowledge to the interests and perspectives of groups or individuals, leaving no basis for choosing one point of view over another. From this standpoint there can be no grounds for choosing between claims to truth and no basis for deciding what is worthwhile knowledge, leading to an undifferentiated concept of knowledge and a position which undermines the very basis for having a distinct formal education system.

Post modernists are critical of neo-conservative traditionalism and technical instrumentalism but their own epistemological relativism prevents them from offering an alternative basis for the curriculum: "I absolutely will not play the part of one who prescribes solutions" (Foucault quoted in Young 2008: 116). Furthermore, whilst the 'progressive' schools of sociological theory have been critical of the overarching policy

approaches, they share common ground with them in that “each, in its own way, precludes a debate about knowledge as a category in its own right” (Young 2008: 18).

According to Young the consequence of this conjuncture of policy and theory is that issues pertaining to knowledge have been ignored in curriculum studies. Instead practitioner focus has been steered towards issues such as assessment, accreditation and guidance processes. The emasculation of curriculum theory has coincided with increasing State direction of curriculum policy with myriad initiatives such as 14-19 Diplomas and Train to Gain “all of which take for granted the assumptions about knowledge on which they are based” (2008: 82). Furedi (2009) highlights this as the paradox at the heart of an education system which is subject to increasing levels of central control and direction, yet in which less actual education takes place.

Postmodernists claim that science provides the paradigmatic model of knowledge, portraying it as based upon universal procedures and rationality and resulting in knowledge which holds independently of socio-historical context. However, Moore and Muller stress the selective and unsubstantiated caricature of science presented by postmodernists, which is derived from a particular form of logical positivism that has never been widely accepted in the scientific community (2010: 70). Similarly they point to the misappropriation of the work of Kuhn in support of their relativist alternative when “he vigorously rejected the idea that his work should be treated as relativist or irrationalist” (Moore and Muller 2010: 70). Citing Alexander, Young notes the limitations of an “epistemological dilemma” expressed in terms of a choice between a positivism which “seeks access to a truth that is in some sense outside society and history” and “a postmodernist view of the inseparability of knowledge and knowers” (2008: 25). The first of these is characterised as “an a-social or *‘under-socialised’* epistemology that defines knowledge as sets of verifiable propositions and the methods for testing them” but takes for granted the social context in which they arise; the second is described “as *over-socialised* – plays down the propositional character of knowledge and reduces questions of epistemology to ‘who knows?’ and to the identification of knowers and their practices” (Young and Muller 2010: 14, original italics). The alternative proposed by Young and the social realists recognises that knowledge is socially and historically derived but stresses

> *(a) the necessary* ***objectivity of knowledge*** *as a condition for any kind of enquiry or reliable prediction…*
> *(b) that knowledge is* ***emergent from*** *and* ***not reducible*** *to the contexts in which it is produced and acquired.* (Young and Muller 2010: 14, original emphasis)

In other words, knowledge is relatively autonomous as it takes on a reality and qualities independent of the conditions of its production. The realist position is characterised by an

ontological realism which recognises "that knowledge is about something other than itself: there exists a reality beyond our symbolic realm", combined with an *epistemological relativism* which acknowledges "that this knowledge is not necessarily universal, invariant, essential truth – we can 'know' the world only in terms of socially produced knowledges which change over time and across socio-cultural contexts" (Maton and Moore 2010: 4). In differentiating this epistemological position from that of the postmodernists, Maton and Moore stress a belief in *judgemental rationality* which "holds that there are rational, intersubjective bases for determining the relative merits of competing knowledge claims" (2010: 4).

Given the rejection of the universalist and absolutist model of knowledge and truth and the wholesale relativism of the postmodernist position, the credibility of social realism as an alternative rests on is explication of the conditions under which objectivity and truth can be established and accepted. Young suggests that while "postmodernism… is trapped in its insistence that objectivity can only be supported by the untenable and a-social claims of positivism" (2008: 27), "philosophers such as Toulmin…have…shown that locating knowledge socially need not lead to the abandonment of truth and objectivity" (p.26). Young takes this further by claiming that "this social basis for knowledge is the condition for its objectivity and therefore can be the basis for decisions about the curriculum" (2009a: 1). This proposition is justified through elaboration of a realist conception of truth. Young recognises the need to restore truth as a guiding principle as "truth [is] the condition for a serious commitment to truthfulness" (2008: 197). Without a belief in truth there can be no value in scepticism, the "reflex against deceptiveness" (Williams 2002: 1). The rejection of *truth* and commitment to *truthfulness* through critique is seen as a fundamental flaw in postmodernism as the terms are mutually dependent (Maton and Moore 2010: 3-4). In direct opposition to postmodernism, Young claims that "the social character of knowledge is an indispensable basis for its objectivity, rather than the condition that makes this objectivity impossible" (2008: 30). Young argues that in its origins and currency knowledge is always the product of particular social, cultural and historical contexts and communities, yet it has a reality over and above particular points of view. It is thus both *social* and *real* in the sense that it has a warranty and significance beyond personal opinion or judgement.

For Young the truth status of knowledge depends on three conditions (2008: 9): that it has external validity, offering convincing explanation or efficacy in its application; that there is internal coherence and consistency to theory; that truth claims are supported by the 'epistemic community' made up of experts in the relevant field. It is the depiction of the operation of knowledge generating communities in the last of these which distinguishes the realist theory of knowledge:

> *the objectivity of knowledge is in part located in the social networks, institutions and codes of practice built up by knowledge producers over time. It is these networks of social relations that, in crucial ways, guarantee truth claims and give the knowledge that has been produced its emergent powers*. (2008: 31)

So as not to reproduce the absolutist error of treating knowledge and truth as given, Maton and Moore note that the social realist "*focus* lies with the properties of knowledge producing fields of social practice and its *problematic* concerns the structured principles and procedures developed in those fields that provide the basis for rational objectivity in knowledge" (2010: 5, researcher's italics). The realist position thus rests on the premise that the professional practices of experts, researchers and academics, can be entrusted with truth creation and this assumes a range of essential qualities such as rigour, exactitude and above all openness to challenge in the conduct of their work. In apparent endorsement of the practices of their peers, Moore and Young take the view that "the objectivity of peer reviews has a social basis in the codes, traditions and debates of different intellectual fields that give it a degree of autonomy beyond the personal and professional interests of any particular group of academic peers" (2010: 25).

Although there is a commitment to the idea of truth and objectivity as a basis of knowledge, the realist position also recognises the provisional and tentative status of knowledge. While it can take on a trans cultural and trans historical character in certain fields and can attain "a degree of objectivity that cannot be reduced to its contexts or origins" (Young 2010b: 31), it is always open to development and modification and therefore has an evolving and dynamic quality. The social realists advocate a fallibilist conception of knowledge derived from Popper and refined through the work of a range of post empiricist writers, including Kuhn (Moore and Muller 2010: 70-73). In keeping with Popper's advocacy of falsification rather than verification as the goal of scientific investigation (1960: 133-4), Young defines fallibility as "openness to critique and revision" (Young 2012a: 143), which means that knowledge can never be taken as absolutely fixed and permanent. This also means recognising that some explanations are better than others: contrary to postmodernism "all explanations are not equal" (Moore and Muller 2010: 73). However, in contrast to Popper's advocacy of a unitary scientific method (1960: 130), Young brings a Kuhnian emphasis on knowledge generating communities to his preferred form of fallibilism, which is "always understood as being 'within a tradition or a discipline'" (Young 2012a: 143). The social realist position is summed up as follows

> *It sits between absolutism and relativism. It agrees with positivism that we do indeed have knowledge, but denies that this knowledge is infallible. It agrees with*

> *constructionism that knowledge is social but does not see this as implying that truth is relative.* (Moore 2007: 31)

Young eschews use of the term social constructionism, preferring to describe as 'social constructivism' the position he associates with postmodern relativism; however, it is contended here that these terms are frequently treated as semantic equivalents when there is value in distinguishing them. Throughout the thesis the terms are attributed to authors according to their original usage but differences in the derivation and referent of constructivism and constructionism are explained in section 4.2.2 and it is suggested that the social realist position is consistent with social constructionist epistemology as outlined.

2.3.3 Social and educational de-differentiation

Young cites a number of trends that he claims are symptomatic of the diminishing import of knowledge in curriculum policy. These include the "increased emphasis in educational research and policy on tacit, informal, experiential, non-codified skills" (2010a) epitomized by Accreditation of Prior Experience and Learning schemes; emphasis on individual choice in offering modularity and 'bite-sized chunks' and in the wider 'personalisation' agenda (Young 2012a: 141); the institutionalising of a 'learning outcomes' approach in programme design and in teacher education; the 'drift to genericism' with the idea that "learning specific contents…is becoming less important" (2010a). There are a number of common features to these trends. They assume processes of learning can be separated from what is being learned; that priority is given to what can be done over what is known; teachers become 'facilitators' instead of sources of knowledge; they prioritize skills over knowledge. As a consequence there is insufficient value attached to the knowledge that can be acquired through formal education as there is nothing distinctive about the learning that goes on within it.

He suggests that "these trends represent an overall social change which can be expressed by the idea of de-differentiation" (2010a) This is characteristic of a 'mass society' where there is increasing commonality in people's experience of work and other social institutions, and knowledge becomes less specialized, while there is increasing emphasis on transferable skills. Young argues that difference is essential as there is a distinctive role for formal education in a modern society which should be recognised and valued rather than undermined. He recounts Durkheim's premise that formal education in modern societies has taken over the symbolic and cultural function previously associated with religion, and goes on to claim that this includes the role played by conceptual and theoretical knowledge in shaping our understanding of our place in the world. It is only if

we value the knowledge generated by communities of specialists and transmitted in identifiable educational institutions that this can be maintained, otherwise educational knowledge merges with the everyday and there is no longer any rationale for an education system. In Furedi's terms "its [education's] transformative power lies in its ability to inspire students to go beyond their experience" (2009: 155). For Young formal education should be about "providing access to the specialised knowledge that is embodied in different domains" (2009b: 14). This entails differentiation between specialist knowledge and the everyday and between separate specialist domains, and also between "specialist knowledge… and pedagogised knowledge" (2009b: 15). Young's account appears to be influenced by perceptions of globalisation and the spread of mass media and new technologies associated with 'late modernity' (*cf.* Barnett 1997: 82). De-differentiation also reflects the pervasive influence of post modernist relativism in a culture in which 'anything goes', knowledge "is reduced to particular standpoints" (Young 2008: 26) and it becomes increasingly difficult to distinguish the worthwhile from the trivial.

The knowledge Young is concerned with is theoretical rather than practical, it offers a deeper level of understanding through structured, discipline based learning and "enables those who acquire it to see beyond their everyday experience" (2010a). Young refers to this as 'powerful knowledge' which has a conceptual character and capacity to transform the knowledge holder's relations to the world and to others. By placing this at the heart of the curriculum, Young claims to offer an alternative to curriculum policy based on "outcomes, competence, learner choice and the accreditation of experience" and "to pedagogy which must begin with learners' experience" (2010a). It counters the trend to de-differentiation by distinguishing "knowledge from experience; school knowledge from everyday knowledge; informal learning from formal learning" and by highlighting the "non-arbitrary nature of knowledge boundaries" (2010a).

Young emphasizes the conceptual and theoretical character of worthwhile educational knowledge, describing the core purpose of education as to foster the intellectual development of students through a concept driven curriculum (2010b: 25). He acknowledges that "knowledge involves concepts, content and skills although the balance will vary across domains" and notes the interdependence of concepts and content: "contents are the bearers of concepts and vice versa" (2009a: 9). He stresses that all information is imbued with theoretical meaning whilst concepts must have "objects of study" (Young and Muller 2010: 22) as "if you remove content the danger is that you remove the basis for access to concepts as well and it is concepts that are the basis for our understanding of the world" (2009a: 9). Young and Muller say little about the nature and contribution of the skills component of knowledge, which they describe as practical

'ways of doing things'. They note that "practical development may refer to new practices within traditional manual crafts…or to new forms of conceptual practice…" (2010: 11). Consequently it might be surmised that 'skills' include those of task completion (vocational competencies) and knowledge gathering (research skills), and could encompass skills in relating, applying and assessing concepts, theories and evidence, which might be considered the territory of critical thinking. Despite this apparent compatibility of critical thinking with Young's description of knowledge, his stated position is that they represent opposing forces in the curriculum.

2.3.4 Critical thinking in social realist analysis

The drift to genericism is a particularly prominent feature of the trend to de-differentiation. Young points to its identification by Bernstein as a 'performance mode' which, in its emphasis on general skills and competencies for work and life, represents a shift away from "both the liberal education and technical craft tradition" in further education (Bernstein 2000: 53). It replaces a subject or occupational trade led curriculum by one based on general and transferable skills that will equip learners with the flexibility needed to move between short term forms of employment in the modern labour market. It is a key curriculum strategy in the technical instrumental ideology and is manifest in a range of recent initiatives, notably in literal form as 'Generic Learning' alongside the 'Principal Learning' of the 14-19 Diplomas (QCA 2008b, Young 2012a: 141). Young suggests that generic principles have been influential at all levels of education and that "typically, they are expressed by such terms as key and core skills, thinking skills, problem solving and teamwork…assumed to apply to all subjects, all regions and all fields of practice" (2008: 156). By associating critical thinking with the trend to genericism, Young suggests it is a symptom of and/or contributory cause of the evacuation of knowledge. It exemplifies the trend to de-differentiation he describes (2009a: 5).

According to Young 'thinking skills' such as "Reich's four Cs – to criticise, conceptualise, connect and compare" are "one of the most well known" instances of genericism (2010a). He distinguishes 'hard skills' of literacy, numeracy and IT and 'soft skills' such as personal development, teamwork and problem solving as facets of genericism. In an unpublished paper (2009a) Young includes critical thinking in the list of 'soft skills'. The 'hard skills' are summarily dismissed as "students are encouraged to learn the procedures but not the principles underlying the procedures" and the 'soft skills' are decried as "unassessable…and…conceptually flawed" (2009a: 2). As an example of a 'soft skill', critical thinking is therefore construed as an *undesirable* feature of the curriculum. Furthermore it appears that for Young there should be no place for critical thinking

programmes in a knowledge focussed curriculum: “problem solving and critical thinking are unnecessary in a conceptually strong curriculum” (2009a: 2). He summarises the problem with genericism in principle: it “separates process from content – thinking from what thinking is about; learning from what you are learning; problem solving from the domain or occupation in which the problem arises” and asserts that this is “no basis for teaching or learning” (2010a). This assessment appears to be predicated on the assumption that effective teaching of knowledge will by definition include development of critical appreciation and sensibilities as this is integral to deeper levels of understanding, and therefore separate teaching of critical thinking is *unnecessary*. Young’s position is diametrically opposed to Kelly’s analysis, in which generic skills such as critical thinking are vital and necessary components of the ‘process’ curriculum he advocates (section 2.2.1).

Furedi is more specifically and directly critical of the role of critical thinking in ‘soft genericism’, describing it as “one of the foundational concepts used by the new pedagogy” which “is often upheld as a positive alternative to the outdated reliance on knowledge acquisition” (2009: 179). Furedi sees it as a powerful rhetorical tool serving a conspiracy to mislead, to “self consciously signal a broad-minded and open-ended perspective on schooling” (p.178). It sounds like an admirable thing when it actually undermines genuine education and furthers the “mystification” surrounding its purposes. Furedi claims that

> *‘critical thinking skills’ are anything but critical. These are taught as a formulaic technique as prescriptive as teaching six year olds to memorise their tables….children do not learn how to think but are taught the so-called skills of thinking… The separation of knowledge from thought by reducing thinking to a form of skill acquisition is on a par with the worst features of rote learning* (2009: 179).

Furedi’s view rests on an image of critical thinking as a decontextualized, generic skill set taught through formal exercises. This is part pedagogical and part epistemological critique as he asserts that “knowing and thinking cannot be reduced to a skill. Thinking and reasoning exist in a relation of creative tension with an object of cognition” (p.179). Just as Young emphasises the domain specific generation of knowledge, Furedi suggests that reasoning skills cannot be extracted and abstracted from the cognitive domains they apply to.

It is evident from the references to critical thinking and thinking skills in the work of Young and Furedi that it is associated with the evacuation of knowledge and is seen as something which obstructs, opposes or replaces a knowledge based curriculum as

advocated by social realists. It is suggested that this rejection of critical thinking rests on assumptions about the specific epistemological and pedagogical forms taken by critical thinking in the curriculum. These preconceptions are judged against the range of concepts of critical thinking reviewed in Chapter 3 and against the specific form critical thinking takes in A level in Chapter 5.

It should be noted, however, that despite the apparent rejection of critical thinking because of its association with the 'evacuation of knowledge', there is capacity and support for an alternative view of critical thinking within the social realist perspective. In highlighting the properties realists associate with knowledge, Young's first suggestion, following Moore (2007), is that it is 'critical' (2012a: 142). By this he means "openness to critique and revision" (2012a: 143) as characteristic of a fallibilist view of knowledge. In this view critical scrutiny of argument and evidence is essential to the testing of warranty for beliefs and therefore critical thinking would seem to have an important role to play in assessing knowledge claims. It potentially offers a test of 'reliable explanations' and a set of dispositions and a methodology which support a process of 'challenge and debate' and a testing out of the basis for establishing and maintaining knowledge. This is particularly the case once it is recognised that Furedi and Young's position is equivalent to that of theorists like McPeck and Bailin *et al.* who stress the subject or field dependency of critical thinking (section 3.3.5).

2.3.5 Critical reflections on Young, Furedi and the social realist approach

In referring to a process of de-differentiation Young appears to be suggesting that there has been a further paradigm shift in the economic and cultural order just as Durkheim had described in the move from forms of society based on *mechanical solidarity* to modern societies based on the specialization and differentiation associated with *organic solidarity*. Given that Young regards the 'loss of knowledge' as an inevitable and endemic feature of a de-differentiated society, by criticising this trend and arguing for a restoration of differentiated knowledge, he appears to be rejecting the social and cultural shifts in late modernity that underpin it. This contrasts with a theorist such as Hargreaves (2006), who advocates embracing the new 'educational imaginary' of the 21st century. Hargreaves describes this in terms of a competency based curriculum rather than a content based curriculum he regards as more in keeping with a 19th century imaginary. Hargreaves' vision for the curriculum has been influential on the rationale for recent trends towards genericism such as the new Diplomas (QCA 2008a): it is driven by the idea of personalising learning and seems heavily influenced by postmodernist notions of choice and self determination in the construction of identity. Young's critical judgement on the role of critical thinking under these conditions of social change is directly contrary

to the views of those in the critical thinking movement who stress the value of critical dispositions and skills in the face of the changes occurring in late modernity (section 3.4.3). From this perspective critical thinking provides essential tools for sifting and sorting through the mass of information encountered in late modern society and for questioning and discriminating between prevailing political and cultural ideologies: in this way it *supports* rather than *negates* differentiation as it engenders a capacity to challenge the taken for granted and to engage with the world in ways which go beyond their 'everyday thinking'.

In his assumptions about the impact of curriculum changes Young appears to conflate policy as characterised in his analysis and the curriculum as it is enacted and experienced. He relates curriculum policy to sociological theory and both implicitly to broader societal characteristics. As such this is a structural analysis which takes for granted and leaves unarticulated the implications for the experience and meanings of those participating in educational processes. Whilst this in itself may not invalidate the accuracy of Young's account, there is a potential credibility gap if judgements made about the value of activities fail to resonate with the experiences of those on the programmes concerned. Young's account is open to accusations that it takes a 'straw man' approach which sets up an oversimplified caricature of the nature, scope and impact of genericism and critical thinking just as the realists criticise postmodernism for its 'straw man' representation of science (Moore and Muller 2010: 70). Neither Young nor Furedi refers to evidence on how critical thinking is taught or experienced by learners and they adopt an undifferentiated concept of critical thinking which does not acknowledge the wide variation in forms it takes, such as the contrast between the broad thinking skills of PLTS in vocational course contexts and the critical reasoning skills expected in the AS/A level. The primary research recounted and analysed in Chapter 5 raises issues concerning the validity of Young and Furedi's description of the nature and impact of critical thinking, and illustrates the importance of recognising the operating context in which students' learning takes place.

The contrast of neo conservative traditionalism and technical-instrumentalism echoes the academic/vocational divide. Young criticises postmodernists for regarding the latter as two rigidly separate alternatives, noting that aspects of the traditionalist curriculum have always linked to forms of employment and it has served instrumental purposes very well for those who have been successful in gaining university places and entry into high status professions; similarly it can be noted that technical instrumentalism in practice is not devoid of a knowledge element, as illustrated by the underpinning knowledge required in NVQs and Apprenticeships, given greater priority under QCF revisions in 2010. While Young has criticised others for ossifying this dichotomy, he recreates it in modified form and contributes to maintaining the dualistic thinking through his own persistence with it as

an organising framework. It is unclear whether the contrasting approaches are meant as 'ideal type' models that policies implemented might approximate to varying degrees. Young also refers to them as 'ideologies', and with this implies that certain unspecified interests are served by each.

Young's characterisation of trends in curriculum policy by the omission of knowledge is arguably based on selective examples. Other policy initiatives can be cited which place issues of knowledge at the heart of matters. For example the establishment of national subject benchmarks for degree courses involves communities of academic peers determining the core knowledge as well as skills expected in different disciplines; the requirement for teachers of basic literacy and numeracy skills in PCET to have specialist subject knowledge in the form of maths or English language degrees or through newly devised specialist diplomas. Apart from some revision to the unit structure and assessment ranges of A level subjects, the courses have remained untouched by the recent curriculum reforms, and are the cornerstone of an academic, content based curriculum. In a similar vein, the suggestion by Young and Furedi that an instrumental genericism, typified by key skills, has been a dominant force in shaping the PCET curriculum and therefore the learners' experience, takes no account of actual time and prominence given to these skills in practice, where a common finding in many institutions is that they are difficult to embed and fighting for space in the curriculum (Casey *et al.* 2006). A level Critical Thinking provides a curious test case for the realists' association of critical thinking with genericism and the evacuation of knowledge. It sits in the traditional knowledge based curriculum of A levels, yet presumes and promotes skills on a de-socialised basis; it is set apart from other subject knowledge yet offers enhanced capacity within it. These apparent contradictions are explored at length in Chapter 5.

In describing the trend to genericism, Young draws the inference that knowledge is of reduced importance: he appears to assume that these developments have been at the expense of knowledge rather than being complementary to it, a position taken explicitly by Furedi,. This 'either/or' (skills/knowledge) representation may be a false dichotomy, illustrated in a parallel with basic maths and English skills as aspects of genericism. The Moser report (1998) was concerned with the impact of low levels of functional literacy and numeracy in the UK on employment and citizenship and included acknowledgement of the benefits of improving basic maths and English skills as a means of opening up access to the wider knowledge curriculum for young learners and adults (Moser 1998: para 4.14). Similarly it is possible that critical thinking skills may *underpin* rather than *undermine* students' acquisition and development of knowledge if it is accepted that the purpose of critical thinking is to test the warranty for beliefs. It may benefit students' performance on programmes of learning rather than detracting and distracting from these, as noted in

relation to A level performance in section 5.2.4. Although Young is critical of genericist models of critical thinking which assume it can be fully realised, epistemologically and pedagogically, without drawing on relevant knowledge contextualizing, there is an alternative critical thinking tradition associated with the work of McPeck (1981) which argues that critical thinking is bound up with the knowledge creating and testing practices of specific disciplines. McPeck, like Young, takes the view that education entails knowledge, and for McPeck this logical entailment extends to critical thinking: "knowledge presupposes justification…justification requires the temporary suspension of belief in order to assess the coherence of the evidence for the belief … [and] such suspension and assessment is critical thinking" (Siegel 1988: 53). In this view critical thinking is fundamental to the warranty for knowledge.

2.4 Chapter summary

Progressive liberal and social realist accounts of the relationship between knowledge and the curriculum have been outlined. The connection between critical thinking and knowledge is central to its significance for the curriculum and it has been demonstrated both how this *has been* and *could be* construed from each of these interpretive frameworks. While endorsement of critical thinking might be expected by progressive liberal advocates of a process driven curriculum, Kelly's advocacy of postmodernism points to a critical thinking based on 'critique on critique' *ad infinitum* and the *cul-de-sac* of relativism. Social realist theory offers a more developed concept of knowledge and its relationship to the curriculum and the edifice of formal educational institutions and is the approach referenced and developed more fully in the thesis' exploration of critical thinking. This approach characterizes policy and curriculum changes in terms of de-differentiation and links this to the advance of genericism. Thinking skills and critical thinking initiatives and programmes are seen to epitomize this trend to genericism and are portrayed as forces opposed to a knowledge based curriculum. However, it has been suggested that there are a number of problems with Young and Furedi's accounts of curriculum change and of critical thinking, notably in the false dichotomy created by representing skills and knowledge forms of the curriculum as opposed to one another. Questionable assumptions are made about critical thinking in practice, which is construed as a weakly realized soft genericist form, and about its epistemological underpinnings when it is taken to rest on a model of universal truth and reasoning. It is suggested that a more differentiated view of critical thinking would facilitate a more complex picture of the relationship between critical thinking and knowledge in the social realist perspective and that alternative field specific notions of critical thinking could enhance rather than detract from a knowledge led curriculum. This line of argument is developed further following an outline of the derivation of and variations in the concept of critical thinking in the next

chapter. The discussion is given a firmer empirical grounding through discussion of the case of A level Critical Thinking in Chapter 5.

Chapter 3: Theory espoused: a conceptual journey

3.1 Introduction

This chapter considers the derivation and meaning of the term critical thinking. It highlights the contested nature of the concept and provides the context for locating the conceptual basis of critical thinking in its A level guise. It adds to existing descriptions of the referent of the concept by noting links to modernity and by explaining the significance of epistemological assumptions. Attention to the detail of variations in the way the concept is conceived and deployed enables a judgement to be made on whether it is critical thinking *per se* or a specific form of it that attracts the criticism of the social realist school. It begins with a specific focus on critical thinking in relation to the work of Dewey, proceeding to note the historical antecedents in philosophy. This is followed by an account of modern conceptions, particularly as associated with the informal logic movement and its critics. The chapter ends with a review of the conceptual terrain and suggests new ways of differentiating positions by epistemological standpoint.

3.2 The significance of Dewey and epistemology

The purpose of this section is to make explicit the basis for the attribution of pivotal significance to Dewey in the development of modern conceptions of critical thinking. This stems from his juxtaposition of critical thinking with reflection as counterpart to 'uncritical thinking' and also from the goals he attributes to it in terms of personal autonomy and democratic ideals. It is also proposed that an understanding of conceptions of the nature and purpose of critical thinking requires appreciation of the influence of different epistemological positions. Dewey's ideas are related to the philosophical tradition from Socrates to the Enlightenment and a particular focus is taken on the relationship between Dewey's concept of reflection and positivist, fallibilist, social constructionist and critical realist notions of science. The extent of Dewey's influence and the significance of epistemological considerations are explored in the subsequent conceptual and curriculum analysis in sections 3.3 and 3.4 and Chapter 5.

3.2.1 Dewey's alternative to uncritical thinking

Dewey's work on the philosophy of education in the early 20th century has been highly influential on the critical thinking movement of the late 20th and early 21st century. Where historical overviews of the derivation of the concept of critical thinking are provided, Dewey is usually cited as a key influence (Cassel and Congleton 1993: 1, A. Fisher 2001: 2, Lipman 2003: 34-38, McGregor 2007: 191). However, there is typically only brief

mention of salient features of Dewey's work and its importance is largely taken for granted. To begin to understand modern conceptions of critical thinking and its place in the curriculum, a more thoroughgoing review of Dewey's work is proposed. His writing on reflection and inquiry as modes of thought opposed to 'uncritical thinking' will be outlined to indicate the *justification* for what has been put forward in the name of critical thinking, and also to demonstrate the origin of specific strands of modern concepts of critical thinking. By referring to Dewey's overarching framework for describing the role of thinking in relation to education and education in relation to society, a basis will be provided for gauging the continuity or discontinuity of recent formulations with Dewey's philosophically grounded approach. It will be possible to see whether they are subject to the same principles and epistemological assumptions and if so what the significance of this is; it will also be possible to assess the consequences of any departure from Dewey's framework.

In his text *How we think* (2007, original publication 1909), Dewey makes only passing reference to critical thinking and does not directly define or utilise the concept. He is, however, highly critical of the limitations of what he describes as "uncritical thinking", referring to this as "the minimum of reflection" (2007: 10). In this there is a reliance on habitual ways of thinking when confronted with problems or perplexities, which acts to limit the development of our understanding and to restrict our capacity to solve problems encountered in our relationship with our environment. Uncritical thinking is characterised by a passive acceptance of the taken-for-granted or received ways of looking at the world. Dewey advocates reflection as a form of thinking which overcomes the deficiencies of uncritical thinking. This is deliberative thinking that means "to turn the thing over in the mind … to hunt for additional evidence" and requires certain dispositional attributes such as an "attitude of suspended conclusion" (p.10). Reflection is presented in opposition to uncritical thinking and thus equates in some sense to critical thinking, its opposite by definition. A. Fisher (2001: 2) suggests that reflection was Dewey's term for critical thinking but it should not be assumed that the two are direct equivalents. Rather, it is more accurate to consider critical thinking to be closely aligned with and overlapping with reflection in opposition to uncritical thinking. Reflection is seen as 'good thinking' which is indispensable to human understanding, learning and knowledge, whereas uncritical thinking is seen as 'bad thinking' comprising lazy habits of thought. By explicitly categorising these as "good and bad thinking", Dewey (2007: 10) appears to provide an ethical judgement on the worth of critical thinking (providing it is accepted that it is inextricably bound up with his notion of reflection).

In Dewey's work on the nature of thinking and its relation to education, reflection is the central organising concept rather than critical thinking. In *Democracy and Education* (2005, original publication 1916) reflection is said to "constitute thinking as a distinctive

experience" (2005: 87) and Dewey proceeds to treat reflection and thinking as synonymous. Reflection is portrayed as an active process of seeking to resolve problems arising in our everyday experience of the world. In this way thinking is grounded in pragmatic concerns. Dewey proposes an inquiry based approach to identifying causal relations and predicting consequences. Reflection involves making inferences and following them through via 'thought experiments':

> *Thinking…is the intentional endeavour to discover specific connections between something which we do and the consequences which result, so the two become continuous.* (2005: 87)

The degree of assent with the inference depends on testing and 'proof' is found when a belief stands up to repeated testing. This requires both a testing out of ideas akin to Descartes' pursuit of "the insight of reason", and attempts to falsify through rigorous empirical testing of "tentative conjectures" as advocated by Popper (1960: 131,134). Dewey sums up the process of reflection in terms of a five stage model (2007: 37-39):

1. Perception of a difficulty in our experience (a problem or disjuncture that cannot be explained adequately from existing knowledge)
2. Location and definition of this (identifying the precise nature of the problem)
3. Suggested solution (hypothesis)
4. Checking this out mentally by reasoning (imagining consequences)
5. Further observation and experiment (empirical testing to arrive at a conclusion via acceptance or rejection of a hypothesis). Alternatives to be tested until a solution that works is found.

He highlights the similarity between everyday inquiry and scientific method and claims that "science is the same operations carefully performed" (2007: 42). Insofar as inquiry represents the thought process involved in responding to doubts, uncertainties and problems, it equates to active and purposeful thinking and for Dewey "all thinking is research" (2005: 88). Thus reflection and critical thinking are not the preserve of "scientists or advanced students" but are qualities and processes to be found and developed among the population in general. Dewey's position is one of philosophical pragmatism whereby the value of acquired knowledge lies in its potential applications. The social definition and significance of this is evident when he suggests that getting an inference as right as possible by following the stages of reflection is vital as "social conditions put a premium on correct inferring in matters where action based on valid thought is socially important" (2005: 15).

The procedural parallels drawn between reflection as a form of thinking and science, and Dewey's epistemological assumptions, are discussed further in the subsequent sections of this chapter. Attention is now given to the relationship between Dewey's concept of reflection and his views on education, thus indicating a starting point for considering the role of critical thinking in the learning process. Dewey sees reflective thinking as naturally occurring but also in need of cultivation. It is a necessary counter balance to our inclination to certainty and credulity (a preference for the 'cut and dried'). Faced with the psychological comfort that certainty brings, the challenge for education is to evoke a willingness to embrace uncertainty and to accept the tentative and provisional nature of knowledge (Dewey 2005: 112). This is the fallibilist view of knowledge advocated by the social realists (section 2.3.2). Alongside this is the need to develop the mentality and skills of inquiry

> *to cultivate deep seated and effective habits of discriminating tested beliefs from mere assertions, guesses and opinions… to develop…open minded preference for conclusions that are properly grounded and to ingrain in the individual working habits, methods of inquiry and reasoning appropriate to the various problems that present themselves.* (Dewey 2007: 17)

Educators must protect the spirit of inquiry found in the curiosity of the child and "transform the natural capacities of inference into habits of critical examination and inquiry" (2007: 18). Dewey advocates a methodology for education built around experience and inquiry, in which careful reasoning and attention to evidence are essential in moving knowledge forward. A prerequisite for this is development of appropriate dispositions or "attitudes and habits of mind". He claims that "the whole object of intellectual education is formation of logical disposition" (p.30). Dewey sees the logic of thinking residing in reasoning to a conclusion. In supporting this there is a need for "systematic care to safeguard reflection to yield best results under given conditions" (p.30). This effectively specifies a role for critical thinking as part of the reflective enterprise as it requires thorough and careful scrutiny of detail and deliberative consideration of evidence and argument.

For Dewey the realm of the intellectual can be thinking about anything as long as it is focussed on a specific identified problem:

> *All genuine reflection, from the most rudimentary to the most highly abstract, exemplifies a single pattern. It always has its origin in a problem, a blocking of habitual conduct.* (Scheffler 1973: 151)

It is the systematic treatment of a problem that constitutes reflective inquiry, not whether its starting point is a concrete or abstract issue. In Dewey's view, each is a prerequisite

to the other if there is to be thinking and learning: abstract reasoning must have practical applications, and engagement with concrete concerns is illuminated through "transfer to intellectual matters" (Dewey 2007: 69). This closely matches Young's account of the relationship between 'content' and 'concepts' in his definition of knowledge (section 2.3.3). Dewey leaves open the possibility of reflection being stimulated by problems perceived in either practical or theoretical domains, with the furtherance of knowledge itself the goal in the latter. In this regard it would seem more appropriate to conceive of Dewey as an advocate of *experimental* learning rather than *experiential* learning that has a necessary connection to individuals' personal biographies. However, the continuing association of Dewey with the latter (for example by Pring 2008) is not surprising either practically given his extensive concern with everyday experience as a starting point for learning, or logically, given the primacy he attributes to lived experience as the foundation of learning: "The power of sustained thinking on matters remote from direct use is an outgrowth of practical and immediate modes of thought" (Dewey 2007: 69).

Dewey sees cultivation of appropriate dispositions as an ethical as well as a logical imperative:

> *habits of active inquiry and careful deliberation in the significant and vital problems of conduct afford the best guarantee that the general structure of mind will be reasonable.* (2007: 29)

Reasonableness is seen as the goal of education as "to cultivate this trait is to liberate the mind from dogmatic adherence to prevalent ideological fashions, as well as from the dictates of authority" (Scheffler 1973: 142). For Dewey, reasonableness is only achievable if there is an appropriate dispositional attitude, a willingness to approach an issue with open-mindedness and to both question and accept criticism in the interests of a reasoned approach. Rather than the analytical reasoning of formal logic, this involves reasoning relevant to real world experience and concerns, which Ryle was to call informal logic and Toulmin the "applied logic" relevant to assessment of "substantial arguments" (2003: 125, 235).

Dewey claims that education is characterised by a tendency to artificially and erroneously separate out the teaching of *skills* such as writing or drawing; *knowledge* as information parcelled up in subjects like geography and history; and *thinking* in the sense of the creative and critical mental states implied by reflection. Skills teaching without any connection to the purposes for which they are used is sterile whilst "information severed from thoughtful action is dead"… "Thinking…has something the matter with it just as thought" (2005: 91) unless it is connected with the acquisition of knowledge that can enhance experience. He is sceptical of skills based subjects which tend to rely on drills in set operations as these become shortcuts which lead to a mechanical approach rather

than a thinking one, as echoed in Furedi's claims about critical thinking (section 2.3.4). Similarly he is critical of the notion of education as a vehicle for transmitting a body of knowledge as this reifies and elevates the status of pre-given information, separating knowledge from the knower and resulting in a didactic teaching method (*cf.* Kelly, section 2.2.1). The focus on inert knowledge or vacuous processes is likely to alienate learners and fail to engage them in a meaningful learning process. He is also critical of conventional subject teaching which seeks to convey "organised subject matter" (2007: 31) where it purports to present both information *and* the logic of the discipline (*cf.* A. Fisher 2001). This runs counter to the assumptions of Young (section 2.3.4) and McPeck (1981) that effective subject teaching and learning will by definition embody critical thinking. This pedagogy assumes that the learner will simply absorb the logical framework along with the information through repetition and osmosis. In this approach 'analysis', including conceptualization and categorization, is done by teachers and experts and is ensconced in key texts. Learning becomes a matter of absorbing these models and reproducing the recipe correctly. In this way of operating teachers tend to elicit inferences from students but have provided the reasoning themselves, meaning that any intellectual development is theirs rather than their students'. Dewey's preferred alternative is experiential or inquiry based learning whereby students ask questions, try things out and work out problems for themselves. In this they can be resourceful, inventive and independent in acquiring relevant and purposeful knowledge, with creative and critical thinking to the fore.

Dewey's work was influential on the development of educational practice in the 20th century, noted by Russell as early as the 1940s (1961: 774). Dewey was adopted as the leading figure in the progressive education movement, and whilst this took on concrete form in specific 'experimental' schools and colleges, its influence infiltrated the mainstream of US and UK education with the prevalence of notions of child-centred and inquiry, discovery or resource based learning. However the interpretation of child-centred to mean *child-determined* curriculum belongs with Rousseau rather than Dewey. This confusion results from Dewey's apparent preoccupation with the problematics of everyday life as a starting point for learning, when his key concept of reflection actually proposes systematic examination and exploration of issues following a scientific methodology. Pring (2008) suggests Dewey's work on the curriculum has more mainstream applicability with the expectation that teachers act as 'mediators' between a body of accumulated knowledge and the needs and interests of the learner. He proposes Dewey as "philosopher of education for the 21st Century" with relevance due to his emphasis on transformation and growth of individuals; his abhorrence of the emphasis on standardisation and measurement in instrumentalist models of the curriculum; his commitment to egalitarian forms of education and his claim that 'we are all researchers'

with its emphasis on constant seeking of new ideas and a willingness to challenge and be challenged in our thinking.

There has been extensive application of the notion of reflection (Kolb 1984, Schon 1983) with ongoing academic debate (Miettinen 2000, Dyke 2006). The 'reflective practitioner' is a central tenet of teacher training, recently institutionalised on the I*f*L professional association website for further education staff, which has an 'online personal learning space' designated as 'REfLECT'. Dewey's influence on the critical thinking movement has been less overt, as might be expected when the concept is mostly implicit in his work. It has been suggested that critical thinking cannot be taken as a synonym for reflection and inquiry. Dewey advocated reflection as a methodology for testing and generating new knowledge, and counter posed this to uncritical habits of mind. Critical thinking can be seen as a necessary corollary to reflection as thinking which unpicks and challenges the products of uncritical thinking and subjects the process of reflective inquiry to critical scrutiny, thus acting as a check on the warranty for its outcomes.

From this account of Dewey's ideas, a range of features can be extrapolated which have potential significance to subsequent developments of the concept of critical thinking and its implementation in the curriculum:

i. Dewey abhorred slavish acceptance of 'inherited wisdom'. Uncritical thinking is inimical to personal autonomy and social development and stymies human progress. It perpetuates the control of the many by the few and works against democracy. Dewey sets out a key role for critical thinking (as implied by his concept of reflection) in the development of human knowledge and human societies.
ii. Dewey sees human development arising from the identification and resolution of problems experienced in relations between people and with nature: critical thinking is thus directed at problem solving.
iii. Among the implementation stages of reflection are creative thinking in the generation of hypotheses and critical thinking in the application and assessment of reasoning and in the selection and evaluation of evidence.
iv. Critical thinking is not just a set of skills to be called upon in isolation, skills are intertwined with knowledge and purposes.
v. Reflection is a systematic and holistic process of definable stages that need to be followed to arrive at sufficient warrant and proof that something works, not a *specific* stage of reviewing actions and evidence as for Kolb (Miettinen 2000). Critical thinking contributes to the process of justifying conclusions and the resolution of problems through implementation of systematic methods of scrutinising evidence and reasoning.

vi. Underpinning the exercise of reflection or critical thinking are a set of dispositions that ensure an issue can be approached appropriately.

vii. Critical thinking is a vital antidote to the complacency and stagnancy induced by uncritical thinking and education is seen as a crucial resource and process for its promotion. Education can only engage learners and promulgate genuine learning if it follows inquiry principles. Therefore critical thinking and education are mutually interdependent.

viii. The kernel of critical thinking can be seen in infant inquisitiveness and it therefore applies to life-long learning. It relates to resolution of real life problems and is relevant to all, not exclusively the 'higher orders'.

ix. While Dewey notes that different subjects have different "devices of inductive inquiry" (2007: 47), he stresses their common features as sites of inquiry: a language for describing things (definitions and classifications); making comparisons; testing alternatives; unseen aspects of reality. This suggests critical thinking should have cross curriculum applicability.

x. Dewey attributes a moral imperative to critical, reflective thinking and the goal is self, social and humanistic improvement.

Section 3.3 considers ways in which a sample of key texts on critical thinking reflect such characteristics and whether they share Dewey's epistemological position. The issue of epistemology is explored in the next section, where Dewey's position is compared with and contrasted to the rationalism of classical Greek philosophy and the empirical scientism of the Enlightenment; it is then extended through an attempt to situate Dewey's notion of science and knowledge in relation to different paradigms (positivism, fallibilism, social constructionism, postmodernism and critical realism).

3.2.2 Philosophical antecedents: classical philosophy and the Enlightenment

The significance of classical Greek philosophy, epitomized by the figure of Socrates in Plato's dialogues, is evident both in its direct influence on the critical thinking movement, and indirectly through its influence on Dewey. The methodology of the Socratic dialogues involves questioning and challenging the beliefs of others, to test out the consistency and coherence of their thinking. It lays bare the assumptions that lie behind commonly held views and through a permanent questioning attitude ensures that there is "…a natural unforced progression towards an encompassing teleologically-ordered explanatory system that reconciles the apparent contradictions of unexamined opinion" (LoShan 1998: 34). It is in effect a method for enforcing rigorous standards for the justification of beliefs through the operation of reasoning.

Socrates' goal is to engage individuals with rational principles and processes and thereby to extend and deepen their knowledge and understanding. Inquiry is conceived as a constant quest moving us closer to the truth. In addition, Socrates equates reason with right and his endeavours serve the development of individuals' moral good as well as their knowledge. His philosophical method is for people from any walk of life and is a lifelong pursuit: "There is no one too young or too old for a challenging conversation with Socrates" (Woodruff 1998: 16). However, later in the dialogues this notion of philosophy for all is abandoned as Socrates is deployed by Plato in the justification of a need for elite training for the leaders in an 'ideal society'. In this the 'philosopher kings' would have a love of inquiry and an ability to think critically and dialectically. They require skills in reasoning, questioning assumptions and in adjudicating between rival claims (A.O. Rorty 1998: 3). Philosophy is deemed to be suitable only for a social elite and only for mature adults (aged 30+) as it is in danger of disrupting the moral certainty needed at an earlier age. In this view children are not ready to question and be questioned.

Socrates is concerned with reasoning in argumentation rather than adoption of an 'argumentative' stance as the sophists did in teaching rhetoric skills to enhance persuasiveness and influence. Socratic education can only have impact if those participating are willing to judge their knowledge against the highest standards and if they have the capacity to grasp the import of the logic entailed in the reasoned discussion. Whilst Socrates denies he is a teacher as he lacks specialist expertise in the areas discussed, his approach assumes a different kind of expertise, in the skills of reasoning and in the knowledge of standards for judging the adequacy of that reasoning. This results in Socrates operating from a position of power in his dialogic relations just as teachers, politicians or others who lay claim to privileged knowledge do. It is therefore unclear how successful the method can be in its avowed purpose of bringing learners a sense of ownership and responsibility for their thinking. However, in defence of the Socratic position, it can be argued that individuals bring a philosophical capability (however latent this may be) to any learning situation. Basic thinking skills develop from childhood as with a disposition to question 'why'; an ability to draw inferences, to recognise and apply classifications, to spot contradictions, to judge validity or relevance (Woodruff 1998: 23). The educator's role is to elicit or activate these skills and to hone and develop them in application to diverse issues.

In Socrates there is a "discontent with easy answers…with any answer that falls short of knowledge" (Woodruff 1998: 28). This sentiment recurs in Dewey's dissatisfaction with traditional and habitual ways of thinking and both embody a kind of intellectual restlessness, never accepting that a final state of settled truth can be found. Both nevertheless dedicated themselves to the cause of improving knowledge. For Socrates the task is to put beliefs to the test through questioning and the reasoning it evinces; this

also forms part of Dewey's model of reflective inquiry in the stage of imagining relations of cause and consequence, of hypothetical exploration. However a significant difference is found in Dewey's call for a scientific approach of empirical testing and proof through efficacy in practice. Socrates was "not a man of science – 'I have nothing to do with physical speculations'" (quoted in Russell 1961: 104). In Russell's view Socrates' dialogic method is useful "wherever what is being debated is logical rather than factual" (p.110). Uncovering logical errors and moving to greater logical consistency is enlightening when dealing with matters of opinion and judgement but "it is quite unavailing when the object is to discover new facts" (p.111).

The starting point for philosophical investigation is very different for Dewey and Socrates. For the former inquiry is prompted by a problematic feature of experience which is typically a real life difficulty as mundane as how to get a chair through a doorway when it appears too wide; for the latter the starting point is conceptual and based on a question of logic such as whether the attribution of beauty to a range of subjects - a landscape, a baby, a grown person, a painting – presupposes that they all have something in common. A concomitant of this distinction is that Dewey's reflection, and with it the application of critical thinking, is a reactive process as it arises in response to a need to clarify a matter and resolve a problem and only seems relevant where new discoveries are sought. Dewey speaks of 'suspended conclusions' which need to be subject to rigorous testing but for Socrates the predominant attitude is of 'suspended belief'. Socrates' approach problematizes concepts and commonsense knowledge of the world; it interrogates the logic and sense that lies behind them. It therefore offers a more proactive model of how critical thinking can be deployed. In Miettinen's account of Dewey, "primary experience is composed of material interaction with the physical and social environment" and "it is the failure and uncertainty of the primary experience that gives rise to reflective thought and learning" (2000: 65). Secondary experience involves reflection and the attribution of meanings and knowledge; its function is to resolve the disjunctures found in primary experience. In this depiction secondary experience is consequential on primary experience, whereas for Socrates it is autonomous and is itself the source of analytical and critical thinking.

The philosophers of the Enlightenment broke with the idealist notions prevailing since the classical Greek philosophers and established the basis for modern notions of empirical science, whilst at the same time advocating the principle of personal and intellectual freedom. Paul and Elder (2002) cite their influence as key to the development of contemporary concepts of critical thinking, particularly the work of Bacon (1985). Bacon suggests that the 'normal' state of the human mind is to be entrapped by conventional dogma, ignorance, self-deception and vested interests. These bad habits of thought are the 'idols' that lead to unjustified beliefs and which he proposes should be opposed and

overcome through empirical study and information gathering. They are the precursor to the 'uncritical thinking' Dewey warns against. Similarly Hobbes advocates a naturalistic view of the world in which explanation lies in reasoning and evidence rather than inherited truths. Subsequently Descartes sets out the need for disciplined thinking, for clarity and precision of thought, in advocating 'systematic doubt'. This is a form of reflection on thinking involving questioning premises and testing the logic of ideas. For Descartes true education is not "transfer of information, doctrine or dogma, but simply cultivation of the intellect" (Garber 1998: 128). In this way Descartes anticipates the idea of critical thinking as a form of metacognition (thinking about thinking). This strand of rationalist thinking has both *ante* and *post* resonances, resembling Socrates' dialogic questioning and Popper's principle of falsification in the advancement of science. Locke's emphasis on the rights and responsibilities of ordinary citizens to apply reasoned criticism to the workings of government rather than passively accepting authority highlights the importance of the autonomy of the individual in a true democracy. The philosophers of the French Enlightenment, Voltaire and Diderot, stress the need for disciplined intellectual exchange in which all parties are prepared to listen to each other and there is 'reasonableness' in the process of critical questioning.

The Enlightenment tradition embodies a particular conception of ethical and political philosophy, summarised by Gray:

> *The core project of the Enlightenment was the displacement of local, customary or traditional moralities, and of all forms of transcendental faith, by a critical or rational morality, which was projected as the basis of a universal civilisation. Whether it was conceived in utilitarian or contractarian, rights based or duty based terms, this morality would be secular and humanist, and it would set universal standards for the assessment of human institutions. The core project of the Enlightenment was the construction of such a critical morality, rationally binding on all human beings, and, as a corollary, the creation of a universal civilization.* (1995: 185-6)

Gray traces the lineage of an ethics shaped by a depersonalised concept of universal reasoning from Kant through to Rawls and critiques the hegemonic influence of the political philosophy of liberalism that stems from it. He describes how a belief in intellectual freedom and critical thought were central to the Enlightenment and have been intertwined with notions of democracy and social improvement: "the project of transcending the contingencies of history and cultural difference and founding a universal civilization that is qualitatively different from any that has before existed" (p.151).

The concept of critical thinking, therefore, emerges from this movement as something with a role beyond pure reasoning, with ethical and socio-political significance. It was

integral to a cultural climate in which there was unwillingness to accept things at face value and a range of radical ideas flourished, in the sphere of economics (Smith, Marx), philosophy (Kant), sociology (Spencer, Comte), psychology (Freud) and science (Newton, Darwin). In Enlightenment philosophy there is continuity with classical Greek philosophy in the emphasis on reason, but a shift of emphasis to the empirical and scientific. Paul and Elder consider Dewey's contribution to this tradition simply in terms of his emphasis on pragmatic concerns grounded in experience. However, Dewey's work is permeated by a broader scientific model of knowledge accumulation and crystallises the accumulated principles of the Enlightenment, focusing specifically and explicitly on processes of thinking, hence it is the key canon connecting the philosophical foundations and modern applications of the concept of critical thinking.

3.2.3 Epistemological paradigms and Dewey

To appreciate the full extent of Dewey's influence on the concept of critical thinking and its realisation in curriculum practice, it is essential to understand his beliefs regarding the conditions for the development of knowledge and criteria for truth. This is a question of identifying the epistemological underpinnings of his work. Dewey's epistemological standpoint is clarified and elucidated through consideration of his position relative to rationalist antecedents and in relation to a range of epistemological positions attributed to him: empiricist (Kelly 1986, 2004), positivist (Phillips 1987), social constructionist (Miettinen 2000) and anti-dualist/pragmatist (R. Rorty 1999). Identification of epistemological assumptions is a core theme in reviewing contemporary critical thinking theory and curriculum theory and policy (sections 2.3.2, 3.3, 3.4), and in considering the constituent content and activities of curriculum practice in critical thinking (Chapter 5). As critical thinking may be advocated in the service of establishing the truth of propositions (Bowell and Kemp 2005: 4,49; West 2009: 3), epistemological assumptions are a key concern.

The rationalist tradition of Aristotle and Plato sees true knowledge embodied in a set of abstract principles and relationships in the ideal forms. The prime examples of these are mathematical and geometric axioms which generate necessary truths in the form of universal and unchanging laws. In this view empirical truths lack certainty and cannot constitute true knowledge as they are only contingently true. The criteria for truth are given by the coherence and consistency of relationships in a fixed system and this is analytic truth, self evident because of the very terms of the system. In this something is true by definition and is discovered through procedures of logical deduction. This is a self validating system with no external conditions of proof. According to Kelly this represents an absolutist epistemology in which knowledge is seen

> *as essentially independent of the observations of our senses, inevitably leading to a view of knowledge as reified, as …God-given, 'out there' and independent of the knower…for them knowledge is timeless, objective, in no sense related to the particular circumstances of individual eras, societies , cultures or human beings.* (Kelly 2004: 26-7)

Dewey rejects knowledge thus defined as potentially irrelevant to the existence and experience of things and also questions the elitism evident in the supposed superiority of pure reason. He is critical of the dualism on which this view is founded, with its separation of reason from experience, mind from body, knowing from doing and the human from the physical world (Dewey 2005: 170). He stresses that this is not an arbitrary dualism, but one which serves specific social class interests (2005: 156).

Where rationalists see reason as the foundation for all knowledge, empiricists grant that status to experience. They invert the primacy of 'mind' over 'body', with the mind being reduced to a passive receptor of sense information; it is the *tabula rasa* (Locke) on which the true properties of nature are imprinted. From our sense experiences we are able to create concepts which can capture and convey the nature and truth of the experience and these concepts provide a means of describing our relationship to the world. Even abstract concepts are seen to derive their sense from the experiences we have, as in Hume's claim that the notion of causation arose from experience of a constant conjunction of events giving rise to a feeling of anticipated consequences resulting from past experiences. These are synthetic truths – they cannot be proven by reason alone as even the laws of physics must make sense in relation to our experience of the cosmos. Russell notes that the properties of truth or falsehood must lie outside the belief so truth depends on external evidence of correspondence to a fact which exists in the world. Facts are not dependent on particular observers' views and are an objective given. In its practical application empiricism has given rise to the methodology of inductive generalisation, whereby theories and laws are proposed from consistencies in the experience and observation of phenomena.

Kelly argues that empiricism leads to a view of knowledge as more tentative and provisional, given the unreliability of our senses, but ignores its dependence on similar absolutist principles to rationalism. Empiricism rests on the assumption that there is a definite world out there to be known through the senses. Although Kelly suggests Dewey's work was a direct extension of empiricism, Dewey explicitly rejected the 'sensationalism' of empiricist representations of knowledge acquisition (Pring 2008), seeing it as predicated upon an inverted form of dualism. As MacIntyre puts it "if all our experience were to be characterised by bare sensory type of description…we would be confronted with not only an uninterpreted, but an uninterpretable world" (2007: 79). In its

own way empiricism fails to capture the nature and role of experience in the development of knowledge. Dewey views experience as 'activity in use' in our interactions with others and the world and sees experimental science as the means to strike a "blow at the separation of doing and knowing" (2005: 161). He seeks a "new philosophy of experience and knowledge…which no longer puts experience in opposition to rational knowledge and explanation" (2005: 160). He agrees with Bacon's claim that we should cease seeking to 'anticipate nature' by imposing preformed frameworks of knowledge, preferring to see the scientist/enquirer as an interpreter of nature, generating insights from experimentation and ensuring that 'knowledge is power' through direct engagement with and relevance to nature.

Dewey's faith in the objectivity of experimental science and his belief in the power of science to shape social progress link his position on the acquisition of knowledge with that of the positivists. So too does his advocacy of scientific methodology as a monolithic model for all problem solving and knowledge creation, regardless of whether the sphere of application is the natural world, humanities, arts, social science or everyday domains (Phillips 1987: 3, 42). The scientific method entails a sequential procedure akin to Dewey's stages of reflection: beginning with observation of phenomena, followed by formulation of hypotheses which are tested through experiments, with careful attention to controlling conditions so that variables can be isolated and accurate measurements taken; providing values and biases are prevented from influencing outcomes, this leads to verification (or rejection/modification) of the hypothesis, which through repeated experimentation can then be formulated as a generalised theory and contributes to the establishment of universal scientific laws. Truth is determined by the accuracy and objectivity of evidence together with the predictive power of verified hypotheses.

For Rorty this privileging of the status of science, which he describes as 'methodolatry', is an aberration in Dewey's thinking, at odds with his rejection of the goals of certainty, truth and knowledge. Nonetheless faith in 'the scientific method' is central to Dewey's project of establishing reflection as a break from uncritical acceptance of inherited knowledge and habits of mind. However the positivist methodology presupposes order and regularity in the scheme of things, which cannot be proven from induction alone. Russell believes knowledge has increased certainty when derived from repeat experiences but recognises that "the greater part of what would commonly pass as knowledge is more or less probable opinion" (1967: 81). Similarly Ayer notes that "no proposition, other than a tautology, can possibly be any more than a probable hypothesis" (1946: 38). For Ayer the test of scientific knowledge is its ability to predict consequences "we test the validity of an empirical hypothesis by…its function…to enable us to anticipate experience" (1946: 99). This is consistent with the pragmatist approach to truth criteria taken by Dewey,

whereby the truth of knowledge claims is determined by what works, both in predictive power and in its practical application to our dealings in the world. In this view something is "true because it is useful and useful because it is true" and "true ideas… would never have acquired a class name unless they had been useful from the outset in this way" (James, quoted in Harrison- Barbet 2001: 153). For Dewey "truth… is not something fixed and final but… evolves since… it is a matter of what works in a changing and evolving situation" (Kelly 1986: 53). There are problems with the definition of usefulness as the criterion for truth in the pragmatist approach as it begs questions of in whose interests knowledge 'works'; also as someone may know something useful which is not actually true, so usefulness is not a sufficient criterion for truth and there is still resort to correspondence to externality or consensus criteria.

Dewey's view of the nature and status of knowledge as always at best provisional and of the moment matches that of Popper's fallibilist position and to some degree that of the social constructionist. Rorty claims Dewey "would have applauded Popper's fallibilism while deploring the dualisms which Popper… took for granted" (1999: 31). In this respect Rorty brackets Dewey with Popper, who he sees as part of the logical empiricist and positivist tradition because of his continued reliance on a belief in a measurable and knowable external reality. However, Popper's philosophy of science initiated a move away from the foundationalist epistemologies of rationalism, empiricism and positivism. He viewed all knowledge as provisional given the impossibility of projecting with certainty the existence of regularities across all times and locations in the universe. In this fallibilist view the task of science is to falsify rather than verify and thus reduce uncertainties rather than prove certain truths (Popper 1960: 133-4). Science is seen to proceed by a series of conjectures and refutations and the onus on scientists is not only to be value free in research (Weber 1970), but to be open to critical scrutiny and discussion of their work. If research findings match a prediction they corroborate a hypothesis, strengthening its status by eliminating a possible objection, but they do not verify it. In a similar vein

> *Rejecting foundationalism, Dewey accepted the fallibilism that was characteristic of the school of pragmatism: the view that any proposition accepted as an item of knowledge has this status only provisionally, contingent upon its adequacy in providing a coherent understanding of the world as a basis for human action* (Field)

In Popperian fashion Dewey describes science as "an intelligent and persistent endeavour to revise current beliefs so as to weed out what is erroneous, to add to their accuracy" (2005: 129). The criterion for a science is that propositions are testable. "Scientific knowledge may be regarded as subjectless" (Popper 1970: 57) not because it is a mere reflection of objective reality, but because theories have a life of their own over

and above individuals. Scientific knowledge should be judged by the truth content of its theories and this depends on its success in resisting attempts at falsification. However, in place of the procedures of inductive generalisation favoured by empiricists and positivists, Popper argues for a reconceptualisation of science which recognises that our ability to grasp the nature of events and objects is underpinned by conceptual tools and theoretical premises: "We approach everything in the light of a preconceived theory" (Popper 1970: 52). Our observations are guided by "hypotheses, prejudice, problem or theory" (1960: 134). He therefore reframes the scientific endeavour as a deductive process where hypotheses and empirical tests are underpinned by theoretical assumptions.

Phillips describes Popper's view of truth as a "regulative ideal" (1987: 24): we can never be sure we have grasped the truth of the objective world, so we set up claims to truth in order to try and falsify them. Thus science generates a progressive movement towards truth and we have 'truth as far as we know it'. In proposing falsification by a test against empirically gathered evidence, Popper still draws on the correspondence truth criteria of empiricists. Truth is always provisional, yet in claiming a progressive accumulation of knowledge through science he presupposes that an ultimate truth is possible. Gray sees positivism as empirically realised rationalism and Popper's work is thus a variant on positivism, whilst at the same time he is heir to the rationalist Descartes in his trust in falsification "only that which survives systematic doubt has rational justification" (Gray 1995: 238). Thus Popper is at once empiricist and idealist in his theory of knowledge.

Dewey's adoption of science as his model for all reflective inquiry typifies "the Enlightenment's ascription to science of a prescriptive authority" which rests on the "pretensions of science to contain a rationally privileged world-view" (Gray 1995: 231). Gray is dismissive of the universalist absolutism this notion of the "supremacy of science" (p.239) entails, referring to it as

> *the illusion that the diverse forms of human knowledge, or even scientific knowledge, can be unified in a single system and brought under the discipline of a single method. The idea that there is such a thing as a unitary scientific method, even a scientific world-view, is merely one of the superstitions of Enlightenment cultures.* (1995: 231)

It is conventional to differentiate "the radical empiricism of modern science" (Gray 1995: 243) from the metaphysics of prior philosophical and religious interpretations of the world, as in Habermas' contrast between the metaphysical as "the thinking of a philosophical idealism that goes back to Plato" and modern empiricism as an "antimetaphysical countermovement" (1992: 29). For Gray, however, science as conceived by the empiricists and positivists "depends on a faith in an ultimate scheme of things that is

ultimately metaphysical" (1995: 244). There is a broad ethical and epistemological congruence between pre Enlightenment and Enlightenment thinking, with the western intellectual tradition based on "foundationalist and representationalist" principles (Gray 1995: 239).

In Kuhn's work (1970) the role of theory in scientific endeavour took a radical departure. Kuhn claims communities of scientists operate in the context of a dominant paradigm prevailing at a given point in time. The paradigm consists of a shared theoretical and conceptual framework and associated methodological principles and practices. In 'normal science' (Kuhn 1970a: Ch.3) the problems and propositions posed by scientists are formulated within this dominant framework of understanding and investigative procedures follow agreed models of practice. The conditions for change arise when the paradigm is brought into question by multiple and prolonged anomalies and discrepancies and when there is a leap of imagination (new ways of formulating a question, new instruments) which eventually involves a critical mass of the scientific community and leads to a reformulation of the area in a new paradigm. Kuhn cites the example from Physics of the replacement of Newtonian mechanics with Einstein's relativity theory. In this view science is not a linear progression towards truth, whether through verification or falsification, but is characterised by long periods of stability interspersed with revolutions in thinking culminating in paradigm shifts. Truth is contained within the terms of the particular theoretical framework rather than based on empirical correspondence: "The proponents of different theories are like the members of different language-culture communities" (Kuhn 1970a: 205). According to Morrow, "paradigms are ultimately incommensurate with one another in the sense that they construct scientific realities that cannot be compared because of fundamentally different uses and meanings of concepts" (1994: 94). It is this social constructionist approach to knowledge which represents the significant epistemological fracture from preceding absolutist models, rather than the shift from rationalism to empiricism as Kelly proposed.

In speaking of "a revolution of prior conceptions of the world" (2005: 173) with the advent of modernity, Dewey had appeared to anticipate the notion of paradigm shift. However this 'revolution' was seen to result from "a piecemeal… business [in which] one problem was tackled at a time" (2005: 172). In emphasis this view of knowledge accretion is more akin to Popper's account of the progress of science than to Kuhn's. Pring equates Dewey's commitment to 'inquiry' with Popper's "evolutionary concept of knowledge" (2008). Nonetheless Dewey shows awareness of both the provisional status of knowledge and its temporal relativity when he remarks that

> *What is taken for knowledge – for fact and truth – at a given time may not be such. But everything which is assumed without question, which is taken for*

> *granted in our intercourse with one another and nature is what, at the given time, is called knowledge.* (Dewey 2005: 172)

Similarly, in rejecting sensationalism, Dewey showed awareness of the social relativity of knowledge: "Mind, understanding, denotes responsiveness to meanings, not response to direct physical stimuli. And meaning exists only with reference to a context…" (2005: 158).

Miettinen presents Dewey as a social constructionist in a paper comparing his concept of reflection to that of Kolb, with the latter portrayed as an empiricist. Miettinen argues that Dewey "formulated cultural mediatedness of observations" (2000: 63) and cites Dewey on recognition of "experience…saturated with the products of the reflection of past generations and by-gone ages" (p.63). However this is about remnants of past reflection which have become established ways of seeing things and a habit of mind. While it acknowledges the historical origins and relativity of knowledge and points to the impact of "prior conceptualisation and cultural expectations", this does not fully reflect the "principle of theory-ladenness" (Miettinen 2000: 62) if the latter is taken to encompass an epistemological worldview with potential ideological implications not just cultural differences. Dewey's concern is inherited and taken-for- granted 'knowledge', however fragmentary, rather than the shaping effect of a broad framework of understanding (paradigm). As for Popper, there is still an assumption that new knowledge can be generated and accumulated in linear fashion from experimental engagement with experience. Therefore Dewey's position overall does not fully match that of social constructionism.

Popper criticises Kuhn's position as relativist: as paradigms are mutually exclusive and irreconcilable and there are no grounds for choosing between them, it would seem to deny all prospect of criticism and refutation. He describes this "Myth of the Framework" as the "central bulwark of irrationalism" (Popper 1970: 56). Phillips develops the critique by stressing that some concepts may have meanings according to what they refer to and may be used across paradigms, for example 'energy' in Newton and Einstein's theories; if key concepts vary then paradigms are not incommensurable as both could be accepted, just as two languages might be spoken; there are likely to be procedures and a metalanguage in common so there is scope for rational discourse and interparadigmatic judgements (Phillips 1987: 23).

Although Popper is of the view we can never be sure of a final truth, he claims science must proceed as if it exists: "I do believe in 'absolute' or 'objective' truth" (1960: 56) otherwise progress is impossible. However Kuhn asserts that the claim that "theories…approximate more and more closely to the truth…will not do" as "there is no theory-independent way to reconstruct what is 'really there'"(Kuhn 1970a: 206). At this

point there appears to be irreconcilability about the positions taken by Popper and Kuhn and in Kuhn's terms we have two competing epistemological paradigms. Contrary to his critics, Kuhn asserts that he is a "convinced believer in scientific progress" and his "is not a relativist's position" (p.206). Instead of increased truth-value, Kuhn suggests this progress can be gauged by a range of criteria such as "accuracy of prediction…and number of different problems solved" and asserts that "later scientific theories are better than earlier ones for solving puzzles in the often quite different environments to which they are applied" (p.206). In this respect Kuhn's position clearly has an affinity with that of pragmatists like Dewey.

Kuhn's view of scientific paradigms follows a normative rationality theory of truth in which truth is granted by consensus within particular conceptual, linguistic and cultural frameworks. The process of justification will vary according to these contexts. Reason used to validate truths is articulated within a conceptual framework but also has transcendental normative quality, i.e. truth is always provisional when context tied but the very prospect of a better conceptual framework that posits a better truth suggests it can be judged in relation to the idealised potential of absolute truth. In this respect Kuhn appears to return to Popper's notion of a 'regulative ideal'. This concept of truth is shared by the recent social realist school (section 2.3.2), which adopts a Popperian fallibilist view of the status of knowledge and a Kuhnian view of the creation of knowledge by specific epistemic communities.

Kuhn's approach to knowledge is social constructionist but is not to be confused with the relativism of post modernism, which claims that "we are certain of nothing…meaning is undecidable and therefore truth unattainable" (Lawson quoted in Morrow 1994: 76-77). This proposition can immediately be seen as untenable as it is tantamount to claiming 'there is no such thing as truth', a claim undermined by its own propositional content. As there is no benchmark of truth, the postmodernist position is immune from criticism. Moreover Morrow argues that postmodernism shares deep assumptions with the foundationalism it criticizes: "The belief that to be worthy of the name, knowledge must be absolutely certain" (1994: 77), as highlighted and criticised by the social realists (section 2.3.2). For Gray, Rorty's postmodernist critique of foundationalism rests on acceptance of an 'illusion' of modernism as a monolithic entity based on universal reasoning. He argues that postmodernism itself is an extension to this 'decontextualized' concept of modernism as it is the logical conclusion to the application of principles of individual choice and freedom which accompany the abstract individualism integral to Enlightenment thinking and traditional liberalism. For Barnett the reduction of everything to individual choice and belief means there can be no grounds for reaching consensus or for advancing knowledge and it is "an utterly conservative philosophy" (1997: 26).

In considering how we know what we know, Dewey modified the usual philosopher's definition of knowledge in terms of 'justified true belief', replacing reference to truth with the notion of warranted assertibility as the absolute status of the former is an unattainable goal. Rorty takes this to indicate a relativist position. Rorty suggests that the idea that "truth is what is supposed to distinguish knowledge from well grounded opinion – from justified belief" (1999: 32) confuses and conflates truth, a quality granted by absolute standards, and justification, which is transitory and relative to audience. Rorty imputes to Dewey abandonment of *the search for truth* as well as of the term itself, which Dewey deemed a kind of category mistake. Pring (2008) points to the absence of the word 'truth' from Dewey's tract on Democracy and Education (2005). On this interpretation, removal, rather than redefinition, reconceptualisation or reclamation of the notion of truth is prescribed by Dewey. In Rorty's view this inevitably means that 'knowledge' too must be abandoned as the conditions for it have collapsed. However, taking the approach of Pring, it should be noted that knowledge is a recurring concern in Democracy and Education, where it is distinguished from thinking or inquiry: "Knowledge, grounded knowledge, is science; it represents objects which have been settled, ordered, disposed of rationally. Thinking on the other hand, is prospective in reference" (Dewey 2005: 190). Contrary to Rorty's argument, it is evident that knowledge has not been abandoned in Dewey, rather it is the outcome of an accumulation of warranted assertions.

Rorty presents Dewey as purveyor of a uniquely pragmatist epistemology. There is no absolute standard for determining truth, there is only justification. What is 'true' is what is a good or effective belief which benefits our attempts to negotiate our interactions with the world: "Dewey taught us to call 'true' whatever belief results from a free and open encounter of opinions, without asking whether this result agrees with something beyond the encounter" (R. Rorty 1999: 119). Rorty acknowledges the 'fuzziness' of this view of justification. It begs a plethora of questions concerning who determines the message drawn and knowledge gained from any 'free and open encounter' and who gains and in what way from the justification of beliefs. Rorty appears to reduce justification to a matter of personal choice and convenience in portraying it as what works for the individual and there are no public criteria for settling the veracity of 'warrants'. This leads Rorty to the assertion that most beliefs are justified and therefore 'true' (1999: 37). His so-called social constructionism therefore takes up an extreme relativist position associated with postmodernism, despite his dismissal of the latter as a "meaningless term" and preference for the label "philosophical pluralism" (p.276). This is a very different social constructionism to that of Toulmin, for whom rationality is field dependent rather than either universal or non-existent; Gray, for whom rationality is culturally and temporally specific; or Kuhn, for whom it is paradigm dependent. It might more accurately be described as constructivism (section 4.2.2). Rorty's reading and representation of Dewey

appears to be an extended ‘appeal to authority’, used to lend credibility to his own relativist rendition of pragmatism. He presents an idealised “reformed Dewey” (p.37) denuded of inconvenient truths such as Dewey’s commitment to advancement of knowledge and trust in scientific method.

Dewey’s pragmatism can also be seen to share common ground with a critical realist position. His core concept of reflection is portrayed as dialectical and avoids the extremes of empiricism, with its notion of objective understanding of an objective reality, and of postmodernism with its notion of subjective apprehension of reality which itself is subjectively constituted. Both induction and deduction are involved in the process of inquiry as there is a move from partial and confused data to a framework of meaning and back again. From this dialectic, theory helps make sense of the particular instance through systematic inference, the “double movement of reflection” is needed to “get valid discovery or verified critical thinking” (2007: 40, 41). Dewey anticipates (or initiates) attempts to dissolve the distinction between inductive and deductive in the debate on reflexivity within the realist paradigm (Archer 2007, Dyke 2009). Bhaskar made a distinction between intransitive and transitive objects of scientific knowledge, where the former are real external objects with an existence outside of any scientific or other concept and the latter are the “theoretically imbued cognitive objects which are produced within science as a function and result of its practice” (Morrow 1994: 78). They “cannot be reduced to the external objects they seek to represent “and can only exist “in more or less historically specific, symbolically mediated and expressed, praxis-dependent, ineradicably social forms” (p.78). For this approach, the criteria for truth are neither empirical correspondence, law given deduction nor simple social consensus. Critical realists advocate methodological pluralism where strategies adopted are appropriate to particular questions or subject matter. In place of a test of truth they draw on Dewey’s instrumentalist notion of warranted assertibility where knowledge depends on the ability of a method and conceptual framework to solve problems. The warranty is dependent on the rigour and validity of the test rather than the truth-value of the findings. The social realist school is differentiated from the critical realists in its emphasis on the necessary role of truth as a determinant of knowledge and in its emphasis on the social conditions for establishing truth and knowledge (section 2.3.2).

The debates in the philosophy of science have shown that there are different concepts of truth invoked reflecting different views of the nature of reality (ontology). For empiricists, positivists and fallibilists it is truth in itself as embedded in an extant external reality, while for social constructionists and critical realists it is truth granted by consensus, coherence and pragmatics. Epistemological positions concerning the relationship of knower and known also diverge. Empiricist, positivist and fallibilist approaches assume the possibility of objective knowledge, that truths can be apprehended without the interference of values

or bias and that testing and replication procedures can establish truths. They all rest on dualist premises, assuming the separation of external reality from the mental processes that apprehend it. In fallibilism knowledge is seen as provisional and tentative with objective knowledge something to aspire to rather than guaranteed. Social constructionist and critical realist approaches view reality as a social creation that is imbued with meaning through language, concepts and theories, and it has no inherent meaning or form. All knowledge is tied to values and perspectives and there is no pure objective state of reality. These approaches have abandoned dualism as there is no longer a separation of subjective and objective as each is constitutive of the other.

There is not a straightforward match between Dewey's work and the broad epistemological paradigms outlined. His epistemological position appears to match that of different perspectives in different regards depending on whether the focus is on how we acquire knowledge (methodology), how we establish truth and knowledge (justification criteria) and what the view taken of the nature of knowledge is (status). This leaves open several possible lines of interpretation: it could suggest inconsistency in Dewey's own position or that the paradigmatic perspectives noted are not closed systems as they may share some epistemological premises despite significant points of difference. It could be argued that his overall position most closely matches that of fallibilism given his advocacy of the scientific model for testing and generating knowledge, which he acknowledges as only ever provisional in status. In this view other epistemological standpoints represented in his work are undeveloped tendencies or have been attributed to Dewey by those seeking to lend authority to their own positions (Miettinen, R. Rorty). If it is accepted that Dewey's epistemology straddles paradigms, it could be taken to represent a unique configuration which should really be regarded as a paradigm of its own: Kelly (1986) is close to suggesting his pragmatism is a distinct position, though he sees it as a development from empiricism; as is Rorty in his account of the pragmatism of a 'reformed Dewey'. Alternatively Dewey's *oeuvre* may be read as a coalescence of epistemological tendencies at a unique moment in the development of epistemological theory, occurring on the cusp of modernity and late modernity and combining the historic and contemporary influences of rationalism, empiricism and science with an emerging social constructionist and critical realist sensibility. Although social realists differentiate their epistemological standpoint from that of the pragmatists with regard to the designation of truth (Young and Muller 2010: 121), they share common ground with Dewey in their recognition of the social context of knowledge production and their adherence to a fallibilist view of the status of knowledge.

In considering the development of critical thinking theory and practice in section 3.3, attention is given to the influence of the intersecting epistemological strands found in

Dewey's work. To conclude this section and provide an orientation for what follows, a number of tentative suggestions are made about the implications of different epistemological positions for the role and scope of what might be expected in the name of critical thinking. Establishing the different conceptions of knowledge that lie behind the theory and practice of critical thinking helps to distinguish different concepts of critical thinking and to demonstrate the nature of the A level form, and facilitates discussion of its significance in the light of the curriculum theories introduced in Chapter 2.

3.2.4 Epistemology and critical thinking

Critical thinking is opposed to the unquestioning acceptance of facts and beliefs we encounter in all aspects of our experience. It can be seen as an approach to checking the warranty for asserted propositions, either prospectively in pursuit of knowledge or retrospectively in assessment of established knowledge claims. The focus and constituency of critical thinking will vary depending on the epistemological assumptions made regarding the nature of knowledge, its derivation and justification. Some preliminary suggestions are offered here regarding how these differences might manifest themselves according to epistemological paradigm.

For *rationalists* knowledge propositions can and should be judged against criteria of formal analytical logic. Logical relations are determined *a priori* by the relationships between elements of a pre-given system. Critical thinking is therefore a process of checking that claims match the criteria of consistency, coherence and entailment associated with deductive reasoning. This approach is entirely concerned with the form rather than substance of an argument. Toulmin demonstrated the limited applicability of this approach to real world arguments in his extended critique of the dominance of analytical logic (2003). He also drew attention to the pitfalls of transferring the criteria and linguistic terms of formal logic (consistency, validity, soundness) to discussion of substantial arguments. Rationalist assumptions may be evident in a critical thinking approach such as that taken at A level insofar as it seeks to make judgements in accordance with universalist principles of logic and concentrates on the relationships between the elements of an argument rather than the substantive content of the issue under consideration.

For *empiricism* the key epistemological challenge is to ensure the effectiveness of representations of the objective reality of the external world. Critical thinking will therefore be focussed on the objectivity and reliability of accounts provided. It is likely to entail criteria for gauging researcher and authorial neutrality (checking for bias) and standards of evidence. These concerns are also central to the pursuit of knowledge following the experimental scientific methodology of the *positivists*. As the goal is to establish proofs,

judgements of the veracity of evidence are essential. As well as objectivity, a range of qualities will be necessary in the conduct of inquiry to ensure the reliability of findings and the explanation thereof, including precision, care, exactitude, thoroughness. As Toulmin notes, the relevance of evidence and premises is a key criterion for assessing substantial arguments:

> *The logical criticism of claims to knowledge is…a special case of practical argument-criticism – namely, its most stringent form. A man who puts forward some proposition, with a claim to* know *that it is true, implied that the grounds which he could produce in support of the proposition are of the highest relevance and cogency; without the assurance of such grounds he has no right to make any claim to knowledge….the general problem for comparative applied logic will be to decide what in any particular field of argument, the highest relevant standards will be.* (2003: 201)

Given the commitment to science as a means for progressive accumulation of knowledge, critico-creative thinking (A. Fisher 2001: 13) also has an important role to play in identifying problems or gaps in knowledge and generating new hypotheses relating to explanations or inferences. As *fallibilists* view science as having an obligation to seek to falsify rather than verify hypotheses, the importance of rigorous checks and scrutiny of data and arguments has even greater significance. There is an imperative to identify and address contradictions and inadequacies in the existing state of knowledge. From this perspective it might be expected that A level Critical Thinking would put both evidence and reasoning to the critical test, thus conforming to the realist view of knowledge as always open to critique. The methodological genericism of experimental science is likely to be accompanied by the assumption of universal applicability of critical thinking processes in terms of the focus, skills and dispositions involved. However Barnett, anticipating the *social* realists, suggests the view of criticism taken is limited in scope as it does not address differences in forms of knowledge or take account of any ideological presuppositions, meaning that "the edifice of this knowledge will remain intact, safe from criticism" (1997: 23).

In *social constructionist* and *social realist* perspectives, epistemology is concerned with the creation and dissemination of knowledge in particular areas of inquiry and within particular theoretical or ideological frameworks. There is a need for subject based knowledge to understand how concepts are deployed and to contextualise the use of evidence. These expectations cannot be met in an A level Critical Thinking which divorces skills in critical reasoning from knowledge of the subject matter assessed. It has been argued that standards for judging logical relations are themselves field dependent (Toulmin 2003: 202); communities of specialists in each field will have their own critical

standards and procedures, and 'knowledge generation' will be subject to the critical scrutiny of peers. Toulmin's work is cited in support of a field dependent critical thinking (McPeck 1981) as well as a social realist definition of truth and knowledge (Young 2008). From this standpoint a dedication to the elimination of bias misses the point as the epistemological starting point is mistaken in assuming truth as a given and bias a deviation from objectivity, rather than recognising that there are alternative conceptions of truth according to theoretical or value position. There are two major implications for the project of critical thinking from this perspective. Firstly it suggests critical thinking must be guided by intra field conventions of evidence and justification (Barnett 1997 called this 'critical thought' to distinguish it from the general reasoning of 'critical thinking'). As such it is entirely consistent with a social realist conception of knowledge. The standards and processes of critical thinking are integral to the establishment of knowledge and will be different according to the discipline, subject or sphere of life concerned. Secondly even within fields, knowledge will be tied to particular theoretical frameworks and the task for critical thinking is to lay bare the underlying differences in values, orientation and ideology that provide the context for knowledge claims. This means standing back from intra discipline concerns and engaging in a form of meta criticism which problematises the foundations of the discipline (or sub schools thereof). Barnett refers to this 'level' of critical thinking as 'critique'. He links this to the critical theory of Habermas which "wanted criticism to extend to take on a form of thought itself" (1997: 27) and emphasises interdisciplinary criticality as a means of opening up new channels of communication and engendering fresh understandings. *Critical realism* offers an extension to social constructionism in identifying and articulating the way knowledge is created and used in the interests of particular social groups. *Postmodernism* denies the possibility of truth and knowledge as there can be no universal standards, only ever different subjective points of view. It is a position that is fundamentally sceptical and leads to 'critique on critique', abandoning the possibility of knowledge acquisition or development. From this epistemological standpoint, the role of critical thinking is to challenge prevailing beliefs through positing alternative perspectives. However, as both Barnett and the realists note, in advocating criticism for the sake of criticism, it leaves critical thinking as a form of denial and rebuttal reminiscent of that of the sophists. The relativism endemic to this approach would leave identification and application of assessment standards in an A level highly problematic.

The various epistemological positions described have arisen under specific socio-historical conditions, but there is not a simple linear progression in which one supercedes another. It has been noted that different positions have been attributed to Dewey and that his influential work can be read as a unique configuration of different epistemological tendencies. They each have some hold in contemporary culture and they are in effect

competing paradigms. These differences are brought out in the account of concepts of critical thinking that follow. Within psychology there is a school of thinking which equates different epistemological positions with different stages of individuals' cognitive development, an approach applied to levels of critical thinking competence by Moon (2008) and considered in section 3.4.2.

A final aspect of the philosophical discussion of knowledge which has relevance to critical thinking concerns the type of knowledge under consideration. It is conventional to identify three types of knowledge (Walsh 1993: 131, Harrison-Barbet 2001: 122, Cardinal *et al.* 2004: 123-4): *knowledge by acquaintance* is what Russell refers to as "our immediate knowledge of things" (1967: 62), which includes direct knowing of particulars such as a person, place or object and in Russell's view also of certain universals or abstract ideas such as knowledge that we exist in time and space; *propositional knowledge* is knowledge *that* something is true, for example that the speed of light is faster than the speed of sound; *procedural knowledge* is knowledge of *how* to do something, be it how to drive a car or split an atom. The focus here has been on frames of reference for conceiving of the nature of propositional knowledge: propositions are statements of belief and to know something is to claim a true belief. In his early writings Hirst stressed the primacy of propositional knowledge (Walsh 1993: 131). He claimed that procedural knowledge always relies on propositional knowledge, for instance to learn how to drive one must know that pressing the accelerator propels the car into motion and that a steering wheel turns the car. However Ryle (Harrison-Barbet 2001: 145-6) claims that it is a category mistake to define knowledge in terms of belief statements. He argues that knowledge is a capacity verb which tells us about skills and dispositions (we ask *how* you know something); belief is a tendency verb about motive (we ask *why* do you believe…?). In this view knowledge is evidenced through successful performance, as in a circus act or a DIY task, rather than what is said about it (Ryle 1949: Ch.2). Because truth only applies to belief statements, it is not a condition for procedural knowledge. If critical thinking is conceived in this way as a set of procedural competencies related to 'how to think critically', it functions as an end in itself as a form of knowledge as it is an object of knowledge, rather than, or as well as, a means to the end of furthering or validating propositional knowledge. This distinction is significant in reviewing the 'evacuation of knowledge' thesis put forward by Young as this rests on the assumption that propositional knowledge is the required content in formal education. This is returned to in the discussion in Chapter 6.

3.3 Concepts of critical thinking post Dewey

The purpose of this section is to provide an overview of the derivation and meaning of the concept of critical thinking, establishing its multidimensional nature and the extent of commonality or difference in how it is conceived. The account is based on a broad selection of texts from the extensive body of literature on critical thinking, with references guided by frequency and prominence in other sources and by the distinctive contribution made to delineation of the concept. In some accounts a wide variation in definition of critical thinking is noted: Lipman lists multiple 'characterisations' (2003: 56-8) and suggests there is overlap and conflict between them, leaving no clear "organising principle" (p.58); on the other hand Moon offers a composite defining statement based on components drawn from contributors from different traditions (2008: 93-97; 126-127). The issue of consistency, disparity or conflict in conceptions of critical thinking is returned to after setting out key contributions and is a prelude to creation of a broader typology in section 3.4.3. The approach taken differs from other accounts in two key respects: firstly it makes explicit the connections with Dewey's ideas on thinking and education, and secondly it seeks to lay bare the underlying epistemological positions adopted by each approach.

3.3.1 The informal logic and critical thinking movement

The consistent identification of the same key figures in the development of critical thinking suggests a common heritage and a clear lineage from the ancient Greek philosophers (Aristotle, Socrates) through Enlightenment philosophy to Dewey and hence to what has become known as the informal logic movement since the late 1970s. This movement arose from a desire to re-establish the relevance and significance of philosophy to students and to public life by engaging with 'real arguments' (A. Fisher 2004) in contrast to formal logic which appeared rarefied and remote in its preoccupation with deduction and symbolic logic. Lipman suggests that the term informal logic originated in an article written by Ryle in 1966 and it rapidly became institutionalised as a movement following a key conference in 1978 and the generation of a proliferation of publications and symposia. Both Lipman (2003: 41) and A. Fisher (2004: vii) identify Scriven as a 'founding father' and Ennis and Toulmin as key figures. A. Fisher refers to the "the critical thinking tradition" (2001: 2-14) which culminates in the informal logic movement and concludes that "it is a changing idea but one which has a core which remains constant" (p.11). The central concern of the informal logic movement is with reasoning and argumentation and from the outset it has been closely bound up with critical thinking:

> *There is a close alliance between critical thinking and informal logic, inasmuch as the latter deals with inferential reasoning that does not have certain conclusions but merely probable ones and does not claim the universality that is claimed by, say, deduction.* (Lipman 2003: 220).

Although it has been positioned as something different from formal logic, there is nonetheless a desire to bring a rigorous and systematic approach to the analysis of real arguments; thus Fisher introduces a "general method of argument analysis" (2004: vii, Ch. 2). The role of critical thinking in this process is to test out the justification for claims through attention to the use of reasoning and evidence.

3.3.2 Skills, dispositions and standards

Dewey's definition of 'reflective thinking' is often taken as a starting point for discussion of critical thinking (A. Fisher 2001: 2; Butterworth 2006):

> *Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends* (Dewey 2007: 7)

This suggests constant questioning rather than passive acceptance of received wisdom and advocates a precise and thorough attention to the basis of beliefs. The focus on grounds for belief concerns the adequacy of the reasoning and evidence used to support it. It is the skills required to assess reasoning effectively that A. Fisher sees as the core of critical thinking. He lists the "fundamental skills which are essential to good critical thinking" (2001: 7-8) as identifying elements in a reasoned case; identifying and assessing assumptions; assessing credibility; evaluating arguments; producing and evaluating explanations; drawing inferences; analysing, evaluating and making decisions; producing coherent arguments. Moon (2008: 41-45) notes the similarity between this list of core skills and those described across a range of generic and subject specific study skills manuals such as Brown and Rutter (2008) and Cottrell (2005). They also underpin the definition and taxonomy put forward by the Cambridge Assessment board as the rationale for the syllabus content and assessment of critical thinking courses run under their awarding bodies (Black 2008). Use of these skills in a careful and systematic manner contrasts with uncritical acceptance of claims or beliefs. A. Fisher takes the view that critical thinking "is a skilful activity, which may be done more or less well" (2001: 14). It is a learnt capacity not a biographical inevitability and Fisher sets out to demonstrate how it can be encouraged through problem-setting and skills modelling.

Fisher's work was instrumental in the introduction of critical thinking to educational discourse and curriculum practice in the UK (Lipman 2003: 38) and his approach reflects

that of the thinking skills movement in the US which promoted the introduction of programmes of critical thinking in schools (Lipman 2003: 30). Much as his American counterparts had done previously, Fisher proposes critical thinking as "a range of *transferable* thinking skills" which should be taught "*explicitly* and *directly*" (2001: 1, original italics). This is advocated in opposition to subject content teaching which, as Dewey noted, leaves the development of thinking skills implicit. Fisher proffers a set of techniques which enable the critical thinker to engage in meaningful assessment of the arguments of experts in specialist fields, claiming that "it requires only a relatively slight knowledge of the subject to evaluate these arguments oneself" (2004: 1). He thus sees it as a powerful toolkit for tackling the challenges afforded in any subject domain, much as Socrates brought the skills of reasoning to bear on a range of philosophical issues. It is as if Fisher elevates the significance of acquiring the *knowledge how* to apply critical thinking skills over the acquisition of *knowledge that.* In this view education should be process rather than product focussed (as for Kelly 2004).

The key elements of the concept of critical thinking found in Dewey were all identified in Glaser's exposition of the theoretical background to his influential critical thinking tests. Glaser (1941) recognises the importance of a critical disposition towards evidence and beliefs, in keeping with Dewey's stress on the need to question the taken for granted. He notes the importance of methods of logical enquiry exemplified by the scientific testing model, and emphasises the need to possess skills in applying methods suitable for implementation of such critical enquiry. Whilst Fisher's work (2001, 2004) concentrates on setting out examples of how critical thinking skills can be applied, he acknowledges the need to be able to recognise when and how to apply them to real life experiences or to material encountered in studies. Thus he concurs with the idea that critical thinking should be viewed as a matter of disposition as well as a set of skills. Differences in emphasis on disposition and skills, notwithstanding acknowledgement of each, characterise the main contributions to the explication of the concept of critical thinking.

Scriven describes critical thinking as an "academic competency akin to reading and writing," suggesting that "critical thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation" (cited in A. Fisher 2001: 10). This bears close resemblance to the higher level cognitive skills of analysis, synthesis and evaluation described in Bloom's taxonomy (Huitt 2004, McGregor 2007: 17). Scriven sees the active thinker not only as someone who adopts a questioning attitude but as one who is able to reflect on and exert control over the application of their own thinking skills via metacognition. This requires an appreciation of standards to judge reasoning by, for example in terms of relevance and significance of evidence. In providing a manual which sets out to improve skill in analysing and evaluating arguments, Scriven also aims

> *To improve your [the reader's]* critical instincts*, that is, your immediate judgments of your attitudes toward the communications and behaviour of others and yourself, so that you consistently approach them with the standards of reason and reasonableness. (1976: ix)*

In this account it appears that dispositions (critical instincts) are to be nurtured and developed through systematic adoption of the techniques advocated; dispositions are assumed to be a product of skills rather than a separate matter of learnt orientation, temperament or cultural capital. Scriven also aims "to improve *knowledge* about the facts and arguments" (1976: ix) in the same vein as Fisher's desire to show "what a long way one can get in understanding any subject by thinking it through for oneself" (2004: 1). While the skills offered are the process skills of *how to* analyse reasoning, they are offered in the service of establishing more conclusive knowledge *that.* By questioning, rejecting and revising lines of thought, evidence and argument, critical thinking skills and dispositions enable us to find greater warrant for the truth of propositions. In this way it can be seen that critical thinking is bound up with the establishment of knowledge rather than antithetical to it as suggested by Young and Furedi. There is a clear relationship between this conceptualisation of the nature, role and function of critical thinking and Popper and Dewey's fallibilist position.

A distinctive contribution from Paul and Elder concerns the role attributed to "universal intellectual standards" (2002: 99) such as clarity, accuracy, relevance, significance. Application of these through appropriate check questions (2002: 110-11) is seen as essential in judging the "elements of reasoning" such as information, point of view, inference, concepts and assumptions so as to avoid mistaken conclusions and to reason effectively (2002: 118-9). This notion of standards is formalised in the assessment criteria stipulated by awarding bodies for assessing the quality of candidates work on Critical Thinking exam syllabi (OCR 2009, AQA 2008). However, Moon suggests that the standard of 'depth' identified by Paul and Elder has not been clearly defined (2008: 58). It is a standard that involves interpretation of levels of competency. She argues that a skills manual approach to developing critical thinking cannot engender depth of critical thinking: "approaches…that involve rule-following are unlikely to achieve real depth of thinking, because the achievement of depth is more holistic and organic" (p.115), which supports the critical stance of Furedi (section 2.3.2). This is explained more fully by Bailin *et al.*, who associate the intellectual resources essential to depth of critical thinking with forms of knowledge:

> *in order to become a (more) critical thinker one must understand what constitutes quality reasoning, and have the commitments relevant to employing and seeking quality reasoning. The knowledge necessary for such understanding includes*

> *background knowledge relevant to the context in question, knowledge of the principles and standards of argumentation and inquiry, both in general and specialised areas, knowledge of critical concepts, and knowledge of relevant strategies and heuristics* (Bailin *et al.* 1999a: 281)

For Bailin *et al.*, critical concepts include the language of reasoning like premises and conclusion, assumptions, inference, necessary and sufficient conditions; types of claim such as value, empirical or conceptual claims; but also depth of understanding of field related concepts (*cf.* Entwistle 2009 on 'threshold concepts'). Bailin *et al.'s* notion of standards for critical thinking is thus contextually tied rather than universal as for Paul and Elder and corresponds to the position taken by McPeck (section 3.3.5). This is the main approach offering a critical alternative to an informal logic movement which promotes a "critical thinking course…which seeks to enhance students' thinking ability *in general*, i.e. without regard to any subject matter" (Siegel 1988: 19, original italics).

Ennis defines critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (1987: 10) thus adding a focus on decision making to the concept. He also suggests that critical thinking subsumes creative thinking, construed in Deweyan fashion as "formulating hypotheses, alternative ways of viewing a problem, questions, possible solutions, and plans for investigating something" (p.10). Furthermore, Ennis claims that it is essential to conceive of critical thinking in terms of dispositions as well as skills.

By dispositions Ennis means "combinations of attitudes and inclinations" associated with critical thinking. He suggests "you might also call them virtues" and gives examples "…to care about 'getting it right'…to care to be honest and clear…to care about the worth and dignity of every person…" (1996: xviii). He identifies more specific dispositions that enable these virtues to be realised (1996: 9), similar in detail to his earlier list of thirteen essential dispositions of a critical thinker (1987: 12-13), including 'seek precision', 'look for alternatives' and 'open mindedness'. Whilst these qualities are relevant to meeting the conditions for warranted assertibility sought by Dewey, the list is clearly partial and subjective, missing facets of a critical approach that others would see as indispensable such as questioning assumptions and adopting a healthy scepticism. Ennis's dispositions are complemented by a list of twelve 'abilities' (1987: 13-15) such as 'judging credibility', 'define terms and judge definitions', 'deciding on an action'. Ennis differentiates abilities from skills, with the latter depicted as a subset of the former, for instance identifying reasons and conclusions in an argument is a skill which forms part of the ability to analyse arguments. Ennis claims that critical thinking as delineated in his taxonomy gives a detailed and precise indication of what should be covered in the curriculum: "Its clarity and criteria make it superior to Bloom's taxonomy as an elaboration of higher order

thinking" (1987: 25). He also presents it as a comprehensive framework for bringing critical thinking to bear on our everyday lives, not just as a model for formal education to follow: "critical thinking is important to us in personal and vocational, as well as civic, aspects of our lives" (1996: xvii). However, Ennis proceeds to outline the recommended approach to critical thinking in terms which clearly assume a target audience of students in late secondary or higher education (he includes a section on "writing a position paper" 1996: 10). Le Blanc states plainly that "our ultimate goal in studying critical thinking is to learn to evaluate arguments" (1998: 1) and Ennis justifies this central focus on argument as follows:

> *You depend on your beliefs, whether you are deciding what to do or deciding what to believe. Decisions about belief, then, are fundamental. A key feature about belief is often an argument.* (1996: 1-2)

Lipman takes issue with Ennis's claim that critical thinking is to help us decide "what to believe and do". He is critical of the idea that it be used to justify the value of certain types of knowledge, rather "the role of critical thinking is defensive: to protect us from being coerced or brainwashed into believing what others want us to believe without our having an opportunity to inquire for ourselves" (2003: 47). It is thus a defence against uncritical acceptance of accounts of the world we encounter either through formal education or in everyday life and is an essential tool for the maintenance of individual autonomy in the face of state and corporate powers: "in a democratic society we need reasonable citizens above all" (2003: 11). Like many of his fellow contributors, Lipman adheres to Dewey's vision of the role of critical thinking in supporting the conditions for democracy. He also follows Dewey's scepticism about beliefs presented as absolutes, favouring a goal and scope for critical thinking which involves "nurturing in students a tentative scepticism" rather than "a set of beliefs of dubious long-term reliability" (2003: 47).

Essentially Lipman's critique of Ennis is based on different approaches to knowledge and truth. Lipman interprets Ennis's view of critical thinking as a means of establishing truth as akin to the positivist position that, subject to rigorous methodology and checks, hypotheses can be proven and truth established. This view of critical thinking is conveyed in simple terms by West at the start of a guide for graduate researchers: "Critical thinking asks the question 'is it true?'…The idea is that if we can spot and remove all knowledge that is flawed, then that we are left with must be the truth" (2009: 3). This is a naïve rendition of a positivist epistemology which takes the view that a fixed truth awaits discovery if only skilled and objective researchers are careful and vigilant in their approach. Bowell and Kemp (2005: Ch.7) offer an explicit justification for this position, leading to the claim that "it is crucial for critical thinkers to recognise that **truth is**

objective" (2005: 285, original emphasis). However, others in the informal logic movement follow Dewey in stating that critical thinking is concerned with "*justified assertion* and *not* about *truth-conditions*" (A. Fisher 2004: 163, original italics). Lipman argues from a Popperian post positivist approach which sees all knowledge as tentative and provisional. Rather than seeing critical thinking as a process for supporting belief and providing a firm basis for action as he claims Ennis does, Lipman posits reasonableness and good judgement as the qualities associated with critical thinking "while remaining cautious and open-minded with regard to beliefs" (2003: 47). He reconciles inquiry and belief by suggesting progressive self-correction through inquiry reduces grounds for scepticism, whilst asserting a fallibilist position on the status of truth and knowledge.

3.3.3 The goal of critical thinking?

Recognition of the dispositional dimension to critical thinking has led to a range of more-or-less explicit extensions to the scope of relevance attributed to it. Paul goes beyond Fisher and Ennis's acknowledgment that critical thinking skills are useful in "everyday life" (A. Fisher 2001: 12) as well as on academic courses. He has developed a more impassioned account of the importance of dispositions in critical thinking. For Paul, critical thinking involves a value commitment as well as a set of skills to carry with us into our everyday lives. He speaks of the need to develop 'rational passions' to ensure true critical engagement with the world:

> *people need extensive and systematic practice to develop their secondary nature, their implicit capacity to function as rational persons…to develop a dislike of inconsistency, a love of clarity, a passion to seek reasons and evidence and to be fair to points of view other than their own…that they live* inferentially*, that they do not have a direct pipeline to reality.* (1987: 130)

Paul describes critical thinking as the antithesis of natural thinking. Where the latter is instinctive and spontaneous, the former is reflective, analytical and logical. The illusion of freedom natural thinking carries contrasts with the autonomy critical thinking brings to individuals' control of their actions and beliefs. Paul believes education should be about the development of human rationality as opposed to institutional enforcement of unthinking belief: "A society of uneducated persons is incompatible with a democratic mode of government" (1987: 131). Critical thinking is essential to and virtually synonymous with education:

> *Education is…a process of autonomously deciding what is and what is not true and false…a process in which we learn to open our mind, correct and refine it,*

> *and enable it to learn rationally, thereby empowering it to analyze, digest, master and rule its own knowledge, gain command over its own faculties, and achieve flexibility, fair-mindedness, and critical exactness.* (1987: 143)

Paul's account closely matches that of Dewey's view of the relationship between democracy and education:

> *[a democratic] society must have a type of education which gives individuals personal interest in social relationships and control, and the habits of mind which secure social changes without introducing disorder.* (Dewey 2005: 60)

Education with critical thinking at its core is seen as a necessary foundation for progressive liberalism and social development. Borrowing terms from Piaget, Paul and Elder locate the predisposition towards 'traditional' thinking described by Dewey, in a natural egocentricity (self-centredness) and sociocentricity (unthinking adherence to views inculcated by the society). The task for the individual is to become a "well cultivated thinker" (2002: 15) and Paul and Elder suggest a six stage programme for skills development that will move a person from the status of an 'unreflective thinker' to a 'master thinker' (2002: 47). There is a striking resemblance between this approach and the route to personal growth and enlightenment offered by various psychotherapies or quasi religions, with a "habit of daily critical thinking" (2002: 310) prescribed much as daily meditation is recommended for followers of Transcendental Meditation. Ultimately the goal is to commit "to lifelong practice toward self improvement" (Elder and Paul 2008: 1) and critical thinking "enables you to be more successful…and experience more positive and fulfilling emotions" (2002: 15), providing "a tool for bridging the gap between what is and what could be" (2002: 130). Where others present critical thinking as an approach to study in formal education, Paul and Elder offer a programme designed to enhance personal growth and fulfilment and to support an ideal realisation of the principles of democracy, all in the service of 'reason'. In Paul and Elder's account of critical thinking as a means of achieving personal enlightenment, there are echoes of classical philosophy's equation of knowledge with the 'ideal spirit'. The presumption of a superior state of being conditional upon critical thinking capability is problematic ontologically as it rests on a value judgement about what constitutes a valuable and fulfilling existence.

3.3.4 Concepts of critical being

The association of critical thinking with democratic goals and an enlightened state of being by Paul and Elder is also found in other accounts. Brookfield sought to liberate the concept of critical thinking from "something undergraduates do in order to perform well on tests of reasoning abilities or to write persuasive academic essays" (1987: preface x).

Brookfield sees critical thinking as fundamental to lifelong learning; he portrays it as an essential life skill for effective functioning in our interactions with work, politics, the mass media and personal relationships. In a similar vein Browne and Keeley claim the applicability of their 'guide to critical thinking' to "numerous life experiences extending far beyond the classroom. The habits and attitudes associated with critical thinking are transferable to consumer, medical, legal, and general ethical choices" (2007: xi). Brookfield stresses its dispositional dimension:

> *This activity [critical thinking] entails much more than the skills of logical analysis taught in so many college courses on critical thinking. It involves calling into question the assumptions underlying our customary, habitual ways of thinking and acting and then being ready to think and act differently on the basis of this critical questioning.* (1987: 1)

Browne and Keeley provide tools for realising a critical disposition through their checklist of questions to bring to bear on any argument (2007: 13). Brookfield goes on to describe the components of critical thinking (1987: 7-9; 15-23). As well as identifying and challenging assumptions, they include challenging the taken for granted context; exploring and imagining alternatives; adopting reflective scepticism. These dispositions are ways of behaving in the world, of interacting with it, not just of thinking. Following Dewey, Brookfield describes the process of critical thinking as one which involves response to anomalies, inconsistencies or disjunctions that arise between expectations and experience. However, he appears to confuse need with capabilities in this account and slips into a loose equation of critical thinking with "reflective thinking" (1987: 24). His account is clearly influenced by Dewey's description of the stages of reflection yet has lost the sense of rational and empirical testing of ideas in the shift to a focus on management of life transitions.

Like Paul and Elder, Brookfield sees critical thinking as important to personal development and to the maintenance and vitality of democracy, claiming that *"*only if adults' powers of critical analysis and reflection are nurtured will a truly responsive democracy flourish" (1987: 68). Similarly for Browne and Keeley

> *The end product of critical thinking is someone who is open to multiple points of view, assesses those perspectives with reason, and then uses the assessment to make decisions about what to believe and what action to take* (2007: 54)

This view of critical thinking as part of personal and social being has been articulated most coherently by Barnett in his analysis of the nature and function of higher education in a modern society. Barnett claims that "critical thinking is a defining concept of the Western University" (1997: 2) and proceeds to criticise the limits of the concept,

particularly as portrayed by those associated with the informal logic movement that present a “single set of actions, skills, propensities or dispositions that can be labelled critical thinking” (p. 3). In this “critical thinking industry”, critical thinking has become an end in itself rather than being “a means to a greater end such as ”better life, emancipation, greater understanding” (p.3). However, it should be noted that proponents of informal logic share these normative expectations, albeit with varying degrees of explicit emphasis.

Barnett also refers to the spectre of critical thinking being called upon as an instrumental tool in the pursuit of organisational goals whilst the goals themselves are left unquestioned. He suggests that “we should dispense with critical thinking as a core concept of higher education and replace it with the wider concept of critical being” (p.7) and asserts that “critical being must be *the* business of higher education” at the core of “a rational society and a self-transforming society” (p.7). This critical being takes the form of “reflexive capacity” (p.6) in our actions and interactions in the world. Critical being is the core element of the three dimensions of the notion of criticality proffered by Barnett; the other two dimensions are critical thinking (application of reason) and critical action (principled follow through from ones critical being). For Barnett the ‘ideal citizen’ is one whose critical being is expressed through transformatory actions, as exemplified in the recurring motif in his account of the lone student photographed resisting oncoming tanks in Tiananmen Square.

In keeping with their emphasis on personal and social liberation both Brookfield and Barnett propose a democratising of learning. They take the view that traditional roles of teacher and student embody unequal power relations and advocate abandonment of the position of teacher in favour of ‘facilitators’ of critical thinking (Brookfield 1987: 235-237) or ‘educators’ (Barnett 1997: 169). The need to “jettison the notion of teaching” results from the redundancy of the teacher as knowledge dispenser in a late modern society where knowledge is only ever provisional, social and problematic (Barnett 1997: 163). This is in marked contrast to Pring’s (2008) stress on the key role teachers have in a Deweyan view of education, as mediator between the store of cultural knowledge at a society’s disposal and the specific interests and needs of individuals. It suggests a close alignment with Kelly’s view of the curriculum and is at odds with the social realist conception of a knowledge led curriculum.

3.3.5 Dissenting voices

> *Learning to reason in vacuo …is as fruitless and sterile as formal logic…learning to reason substantively involves learning about the actual subject areas* (McPeck 1981: 81)

The work of McPeck is conspicuous by its absence from the overview of the critical thinking tradition provided by A. Fisher and is acknowledged only "in passing" by Lipman (2003: 43). McPeck was critical of what he perceived as a bandwagon effect associated with the critical thinking movement in the US, which resulted in the opinion that it "should be taught in our schools whenever possible" (1981: 1). McPeck claims that "the persistent vagueness of the concept supports curriculum proposals ranging from courses in Latin to logic and clever puzzle games" (p.2). Critical thinking is seen as an "over worked and under analysed" term (p.2) with proponents such as Ennis glossing over the meaning of the term in a headlong rush to list defining characteristics. In McPeck's view this approach lacks any real conceptual analysis as there is no attention to epistemological assumptions that make clear the relationship between critical thinking and knowledge.

McPeck claims that thinking is always *about* something (X) and thus it is "surprising that critical thinking has been reified into a curriculum subject and the teaching of it an area of expertise of its own" (1981: 4). He acknowledges it can describe *how* something is thought about as a form of general skills, yet he claims it cannot stand alone as it cannot be sufficient to evaluate knowledge in specific subjects given the different epistemological bases of these disciplines: "To the extent that critical thinking is not about a specific subject X, it is both conceptually and practically empty" (p.5) and saying "I teach critical thinking" is "vacuous" (p.5) or "muddled nonsense" (p.13). In McPeck's view "critical thinking cannot be divorced from the skills that make the activity what it is" (p.9), whether that be, for example, a piece of historical analysis or science: "the standards and criteria for rational thinking are uniquely determined by the disciplines themselves, and not by some external criterion separate from them" (1994: 115). His philosophical position receives support from Gardner's (1993) psychological treatise on multiple intelligences. Gardner acknowledges the value of certain 'habits of thought' such as considering alternatives and adopting the perspective of others but claims that these cannot be assumed to transfer readily 'across domains':

> *as with the case of memory and other "across the board" faculties, a closer examination calls their existence into question…Instead, particular domains of human competence seem to require their own brand of critical thinking … the kind of thinking required to analyze a fugue is simply different from that involved in*

> *observing and categorising different animal species, or scrutinizing a poem, or debugging a program, or choreographing and analysing a new dance.* (1993: 44)

Like McPeck he concludes that "it makes little sense to have "stand alone" courses in critical thinking" (p.44). For McPeck and Bailin *et al.* meaningful critical thinking

> *includes not just rules of logic but also standards of practical deliberation, standards of argumentation, standards used in developing plans of action, standards governing judgements made in the course of action (e.g. athletic performance) and standards governing inquiry and justification in specialist areas such as art, biology, history, literary criticism, mathematics and technology.* (Bailin *et al.* 1999b: 291)

McPeck follows Dewey in suggesting that critical thinking entails "suspension of assent" and "it does not take truth for granted" but "considers alternative hypotheses and possibilities" (1981: 6). Despite his rejection of prevailing views of critical thinking, McPeck combines the elements of skill and disposition referred to by others in his definition of it as "the propensity and skill to engage in an activity with reflective scepticism" (p.152). He acknowledges that both are needed as the inclination and intention are essential to application of skills, whilst skills are needed to ensure an effective capacity for critical thought. What distinguishes McPeck's approach is his insistence that reflective scepticism requires some knowledge of the field concerned. The reliance on generalist skills of reasoning commits the 'philosopher's fallacy' of conflating *necessary* conditions for critical thinking with *sufficient* ones. As a consequence "the student is placed in the unenviable position of having to assess [arguments] without the necessary information" (p.28); alternatively, programmes of critical thinking may steer away from material that calls for knowledge and experience of a particular field and focus on the everyday domain such as newspaper articles and speeches by public figures (as in A level papers in Critical Thinking) thus diluting and diminishing the engagement with knowledge. In place of this McPeck advocates an "epistemological approach to critical thinking" (p.22). This requires an understanding of the basis of beliefs and criteria for truth in a subject, such as the standards of evidence. McPeck's position was influenced by that of Toulmin, who argues that in place of the "*field-invariant* standards of validity, necessity and possibility" (2003: 202) proffered by traditional analytical logic, we need to develop "*field dependent"* criteria for assessing reasoning. The search for alternatives to formal logic explains the association of Toulmin with the informal logic movement but he does not share the generic view of reasoning and critical thinking that is prevalent amongst its adherents. Toulmin claims there is a need to consider the established warrants for judging inferences drawn from premises in different fields such as science, art criticism, ethics, law. As there is an "irreducible

difference between the sorts of problem with which arguments are designed to deal" (pp.162-3) it is necessary to look within each field at the "common procedures for testing warrants" (p.162). The business of "epistemological analysis" (p.238) is "to study the structures of our arguments in different fields, and to see clearly the nature of the merits and defects characteristic of each type of argument" (p.235). The project Toulmin set out for 'applied logic' was to identify the logical relations characteristic of different fields and to establish standards for assessing arguments accordingly. For McPeck the break from formal logic went further as a shift of emphasis is needed so that s*emantic* understanding (the meaning of concepts and their relation to theory) is seen as more important than *syntactic* understanding (the logical form of relations in an argument). In the emphasis on setting critical scrutiny within the conventions of different fields McPeck's position is compatible and consistent with the social realist emphasis on knowledge as the domain specific outcome of the activity of separate epistemic communities. It would appear that the critique of critical thinking offered by Young and Furedi rests on an assumption that it follows the genericist model of the informal logic movement, whilst there are alternatives which are compatible with the social realist concept of knowledge.

McPeck does not offer a basis for designation of disciplines, nor Toulmin for 'fields', but in other respects his account echoes Hirst's 'forms of knowledge' thesis which claimed that seven domains were distinguishable by "their logical character" (1974: 84):

> *The three areas in which the differences are to be found are the concepts and the logical structure propositions employ, and the criteria for truth in terms of which they are assessed* (p.85)

This is consistent with Toulmin's depiction of forms of logical relations as constituent components of specific fields and thus as a distinguishing feature of these different domains. Although Hirst stressed he was not proposing absolute categories with permanent tenure, he nonetheless suggested cultural and temporal universality, "the generality of certain conceptual schemes and their relatively timeless status" (1974: 94). In contrast Toulmin points to the temporal and cultural relativity of standards of logic in particular fields, opposing the idea of universal and eternal standards of logic by stressing a need for "reintroduction of historical, empirical and even…anthropological considerations" into the study of logic (2003: 234). McPeck's position on this key difference in orientation is not made explicit, though his dismissal of Hirst and Peters' work for its academic detachment, and general support for Toulmin's approach, suggests a stance more akin to the latter's. Young's social realist account of knowledge refers to Hirst as well as Toulmin in support and whist noting the contextually specific generation of knowledge in line with the latter, he also stresses the character of 'powerful knowledge' in taking on a trans-historic form, in keeping with Hirst's view: "what makes powerful

knowledge powerful is its independence or autonomy from the specific contexts of its origin" (Young 2012a: 143).

In Hirst's account, disciplines and subjects were subsets of the broad forms of knowledge and McPeck appears to regard these as distinguished in a similar way by both content and methodology: "the various 'forms of thought'…have a logic, texture, and relevant background knowledge that are peculiar to themselves" (1994: 103). McPeck cites Passmore on the need to foster critical dispositions for citizens to be "independent, critical, capable of facing problems" (Passmore 1967: 200) and that this must be supplemented by 'initiation' into the "major traditions of critico-creative thought" on a discipline specific basis. He suggests teachers would benefit from greater schooling in 'philosophies of' specific disciplines if they are to foster deeper criticality in their students (1994: 116-7). Barnett, however, warns against treating critical thinking as something unique and undecipherable in each of the "epistemic communities" (1997: 3); while Phillips' criticises Hirst on the grounds that

> *mathematical techniques play an important role in the physical sciences and the human sciences; observation, collection of data, use of control groups, and other techniques used in empirical testing of hypotheses are important methodological features of both the human and the physical sciences, and…are used in historical research.* (1987: 132)

At the same time the variety of truth criteria and concepts found within the broad disciplines identified means that "disciplines of knowledge...may be validly mapped in an indefinite number of ways" (Walsh 1993: 120). Neither McPeck nor Toulmin provide a rational basis for the divisions found, they are taken as empirical facts, thus leading to a potentially infinite relativism in their accounts of disciplines and their logic.

For Barnett the McPeck – Ennis debate is misplaced and is "going nowhere" (p.64) as it is based on a false dichotomy which limits the defining scope of the conception of criticality: it centres on a dispute about what critical thinking *is* rather than what it is *for*. Nonetheless Barnett recreates this dichotomy in distinguishing *critical thinking,* defined as a generic "assembly of skills" (p.17) from *critical thought,* described as communities of experts who define, maintain and develop critical procedures and standards in generating knowledge. McPeck's position on the epistemological specificity of subject domains is exemplified in the recent applied work of Entwistle (2009) on the 'distinctive ways of thinking' found in different subjects. Entwistle has moved on from focus on the generic properties of 'deep and surface learning' (1983, 1991) to identification of core concepts and processes that provide the key to subject mastery (2009). It is evident that there is implicit support for the emerging social realist view of knowledge (Moore 2007, Young

2008, Maton and Moore 2010) within both applied and philosophical approaches to education studies and that a contextualized form of critical thinking is highly relevant to this.

3.4 Reviewing the concept of critical thinking

The purpose of this section is to establish a baseline in terms of 'theory espoused' against which policy and practice in critical thinking as an A level can be compared. Consideration is given to the degree of consistency or conflict in the uses of the concept in the literature reviewed, and whether it is possible to refer to theory espoused as a unified whole containing agreement in principle on key features of the concept. In addition to mapping out the conceptual terrain, pedagogical implications are identified. The section begins with a brief review of the value of a range of classification frameworks in 'making sense' of critical thinking. The criteria identified by D. Kuhn for assessing the value of concepts are drawn upon, *viz.* accuracy, consistency, scope, simplicity and fruitfulness (cited in Lipman 2003: 232). This is followed by a detailed critical account of the recent analysis of Moon (2008) before a new multi-criteria classification is presented, which incorporates epistemological differentiation.

3.4.1 Classification frameworks

A range of classifications have been put forward either to illuminate variations between forms of critical thinking or to differentiate critical thinking from related concepts:

Quellmaltz (1987) suggested parallel traditions in philosophy and psychology, with the former focussed on the quality and products of thinking (Scriven, Ennis, McPeck) and the latter on cognitive processes (Piaget and Bloom). However, this is a somewhat forced distinction when proponents of critical thinking draw on aspects of both disciplines, for example Paul and Elder (2002). While Dewey's work concerned philosophical questions about the nature of thought and knowledge, it has been attributed a psychological dimension with its depiction of scientific inquiry being rooted in approaches to everyday problem-solving (Lipman 2003: 35). Quellmalz suggests that there is, in any case, equivalence in the common core of reasoning skills described in either discipline and therefore that the essence of critical thinking is discipline specific neither in application nor in derivation. The distinction between philosophically and psychologically derived notions is not a particularly fruitful one as it lacks consequences for concepts of critical thinking in use. However, it is argued that differing conceptions of epistemology in the two fields lead to different interpretations of the role of critical thinking across stages of education (section 3.4.3).

Paul and Elder (1987, 2002) made a distinction between *weak* and *strong* critical thinking, subsequently adopted by Browne and Keeley (2007). Weak critical thinking is simply a form of being argumentative, seeking to find fault and undermine an opponent rather than engaging in argument in a balanced and reasonable way. This is akin to the rhetorical attempts at 'points scoring' often witnessed from politicians. In contrast strong critical thinking is higher order thinking which requires a fair minded disposition, with a willingness to be self critical and to listen and take a considered view, combined with a measured, evidence based use of reasoning. This is motivated by a genuine search for truth rather than a desire to impose a set of personal beliefs onto others. The difference parallels that found in the approaches of the sophists (weak) and Socrates (strong) in ancient Greek philosophy and culture. In effect, however, Paul and Elder's distinction simply differentiates their notion of critical thinking (the strong version) from everyday usage of the term (the weak version). Its scope is limited as it does not capture significant variations between the concepts of critical thinking proposed by different theorists or supported by different epistemological positions.

Barnett (1997), as noted above, differentiates critical thinking from critical thought. He creates a semantic triad by distinguishing *critique* from both of these. Where critical thinking is an individual cognitive process and critical thought a discipline based commitment to review and develop knowledge, critique involves critical evaluation of the discipline itself. It is metacriticism that takes a broader look at the discipline, often drawing on an interdisciplinary approach. Thus Barnett's play on words nonetheless reflects significant semantic variations. Barnett's terminology has the merit of defining terms with precision and therefore matches D. Kuhn's criteria of simplicity and accuracy. It is a categorisation with relevance to the debate between generic and field specific concepts and to the application of curriculum theory and is returned to in the Discussion Chapter. Barnett's categories are distinguished according to the object of critical thinking; he also differentiates between critical thinking, critical being and critical action as forms of relationship between the self and the world, which are at the heart of his thesis about 'criticality'.

Moon's recent overview (2008) is multidimensional and is given particular attention for reasons outlined below.

3.4.2 Exploring the landscape – Moon's analysis

Moon's "exploration of theory and practice" in critical thinking appears a particularly apposite text for this thesis. Its express intention is to move from "the theory to the development of a working definition…and then use the defining statement as a broad principle around which pedagogical principles and practice could be developed" (2008:

vii). Moon states that “one of the major points that [her] book is designed to make [is] that there are unclear understandings as to just what critical thinking is” (p.3) and “it is time to explore the landscape of this term” (p.5). Her promise to “map the territory of critical thinking” (p.35) seems well matched to a thesis researching the meaning and implementation of the concept. Moreover, while “the focus of [her] book is higher education and professional development…ideas will also be of interest to those working in post-16 education and in particular, those teaching Critical Thinking at ‘A’ level and Theory of Knowledge on the International Baccalaureate courses” (p. vii). Moon claims to take a “constructivist stance” (p.9) and offers a focus on “epistemological development and depth” (p.12, Ch.5) and in these respects the work appeared to anticipate the problematic that stimulated this research, the sense that what is being done in the name of critical thinking is constrained by a particular set of epistemological assumptions.

Moon’s exploration begins with discussion of student, teacher and ‘common-sense’ views of critical thinking on the grounds that it is necessary to encompass the understandings of those directly engaged in the activities of critical thinking if a meaningful pedagogy is to be proposed (p.19). However, the evidence base concerning how “teachers, learners and others regard critical thinking” (p.19) is extremely limited, consisting of definitions of the term elicited from her own colleagues and similar views reported in research by Phillips and Bond based on “thirteen second year New Zealand students” (p.24). Nonetheless, even this brief overview demonstrates strands of both similarity and difference in definitions of critical thinking. This is supplemented by a brief lexical deconstruction and discussion which brings out further nuances of meaning of the term. An initial formulation of the concept follows: “a process in which we generate knowledge by bringing to bear a particular way of working with knowledge” (p.25). Critical thinking is presented as an umbrella concept encompassing analysis, understanding, review, evaluation, problem-solving (table 2.1, p.30). Moon describes these as “tools for the manipulation of knowledge” (p.30) and cites Bloom’s category of higher order skills and Entwistle’s ‘deep’ learning in support (p.26). She goes on to list different critical thinking activities, linking it to assessment of arguments but also ‘of an object’, ‘an incident’ or about the self (p.32). Moon is driven by a commitment to develop “a sufficiently comprehensive picture of critical thinking” (p.14), but the breadth of use of the term renders it indistinguishable from approximate synonyms such as ‘review’ or ‘reflection’.

Moon’s ‘mapping of the territory’ continues with a literature review which provides an overview of different accounts organised in sections described as ‘approaches’ to critical thinking (2008: 38-53). This begins with a critical discussion of approaches through logic, which she contextualises as “for thinkers of the past” (p.38). Moon dissociates her work from “formal logic” (p.40) but makes no mention of the analytical reasoning associated with this. The writers she cites (Bowell and Kemp, Van den Brink-Budgen, Ennis, A.

Fisher, p.39) are all exponents of *in*formal logic. Her analysis is afflicted by imprecision in the use of key terms, which is furthered by her conflation of logic with pursuit of 'objectivity' and 'objectivity' with 'objective truth' (p.39). This leads to an indistinct 'distinction' between "writers from the 'logic' camp or from approaches that were more variable and which did not work primarily on the basis of objective truth" (p.39). Toulmin is intriguingly described as following a 'middle line' yet Moon goes on to suggest that

> *there is a division between those whose concern is the process of argument and those whose concern is the management of complex and constructed interrelationships between learning, knowledge, epistemology, values, beliefs and the quest for ideas to live by.* (2008: 40)

Toulmin's key informal logic text on the Uses of Argument (2003) would clearly place him in the former category in focus whilst exploring the latter factors in its analysis. Rather than a 'middle line' it offers a coherent juxtaposition of argument analysis with epistemological concerns. There is further conflation in Moon's account as argument analysis is bracketed with commitment to the notion of objective truth, as if this were an inevitable concomitant; whereas it was noted earlier that much of the informal logic movement, following Dewey, is directed to conditions for warranty of assertions rather than absolute truth. The oppositions Moon sets up are rhetorical in nature and effect, designed to engender support for her unfolding position on the scope and object of critical thinking. Whilst her alternative to logic/objectivity/argument analysis is broadly defined and somewhat elusive, she does intimate that concepts of critical thinking are shot through with issues of values and epistemology, thus bringing to the fore key considerations which are neglected in most previous overviews.

Moon describes a range of examples of approaches which set out the component processes, skills and abilities of critical thinking and which are "less rule bound than formal logic" (p.41). These include the work of A. Fisher, earlier linked to the 'logic' approach, yet she omits reference to Ennis, whose taxonomy is generally taken as the reference point for the skills inventory approach. Instead she focuses on practical study skills manuals such as that of Cottrell (2005). Despite the derivation of this kind of approach from the informal logic movement she appears to reject, Moon concludes that "there are identifiable skills and processes that may be part of critical thinking" (p.45). This approach is seen to be supplemented by one which emphasises dispositions towards criticality, citing the work of Brown and Rutter (2008) aimed at developing critical practitioners in social work. She identifies the work of Barnett (1997) as the apotheosis of this approach with its emphasis on the need for transformation of critical self reflection into critical action. Critical thinking as "a general set of attitudes and habits towards everything" (2008: 48) is included in Moon's accumulative definition. Later she adds her

own descriptor to this, couching the relevant dispositions in a specifically educational context when she applies the label 'academic assertiveness' to "a set of emotional and psychological orientations and behaviours that enables a learner to manage the challenges to the self in progressing in learning and critical thinking" (p.79). However, this simply involves a reformulation of the dispositions others have previously identified, including "willingness to challenge…or accept a challenge" (p.81); "willingness to listen and take account of the viewpoint of others" (p.84).

The final approach referred to by Moon is one taken from developmental psychology. This indicates "a series of conceptions of critical thinking that match developmental progression" (p.49). Moon cites recent writers (D. Kuhn, Phillips and Bond), who focus specifically on this in relation to higher education learners, rather than earlier holistic developmental approaches such as Piaget's (1970). Moon herself endorses this approach and her elaboration of it provides her most distinctive contribution to the analysis of the meaning of critical thinking. However, there is no indication of whether these 'fundamental' cognitive stages are physiologically determined or latent capacities reliant on teaching and learning processes in (higher) education to activate them. There is also some confusion as to whether the relevance of this is in describing the *nature* of critical thinking or the *conditions* for it. The two are conflated in Moon's claim that "true critical thinking cannot occur while the learner is in the more naïve belief state about the nature of knowledge" (p.49). Nonetheless, the idea of a 'developmental sequence' is added to Moon's characterisation of a critical thinking pedagogy.

Moon's review of literature provides some indication of variations in the use of the concept. It has been shown that in some cases the types of approach described lack precise foundation ('logic', 'developmental') and that there is inconsistency in her classification of some of the authors (A. Fisher, Toulmin). There is no systematic basis to the distinctions between approaches and it is not clear to what extent they are seen as mutually exclusive; while the 'logic' approach is rejected, the others appear to be taken as different facets of the issue which can work together under an overarching concept and pedagogy. We are presented with a mixture of approaches differently concerned with the derivation of critical thinking ('logic' or developmental psychology), the purpose of it ('ways of being'), conditions for it ('pedagogy'), what it entails *doing* ('processes, skills and abilities'). Moon's separation of approaches is a convenient device for organising her own overview but does not provide a basis for mapping similarities or differences in concepts of critical thinking. She also describes approaches to critical thinking 'that take an overview' (*cf.* section 3.4.1.). Ennis's taxonomy is included here as a comprehensive overview of skills, dispositions and abilities. Halonen is cited as distinguishing nature, context and propensity components thus providing a potential means of classifying the approaches Moon describes. Most attention is given to the work of Mingers, which sets

out a series of levels of critical competence as a basis for organising the teaching and assessment of an undergraduate management programme, and includes the criterion of depth of critical thinking which Moon later develops. This is done with reference to Bailin *et al.*'s (1999) account of quality in critical thinking which emphasises the "need to take into account the **level of knowledge**, the content of critical thinking" (Moon 2008: 53, original emphasis) as well as the formal assessment of reasoning.

In addition to this overview of 'overviews', Moon offers a tentative list of suggested 'dimensions' that "cut across the approaches" (p.37). These dimensions are effectively a range of criteria which distinguish between different meanings and deployment of the term. These include different views on the scope of the concept ('breadth'), for example as a set of reasoning skills (A. Fisher) or way of operating in the world (Brookfield); views on the age/stage relevance of critical thinking development ('longitudinal'); pedagogic position ('way it is viewed in relation to the discipline of the learners'); the discipline the concept derives from (*cf.* Quellmalz). These distinctions may be fruitful as a basis for assessing the consistency or conflict between uses of the concept and a summary 'conceptual audit' using similar dimensions, albeit augmented, is offered in section 3.4.3. This provides a basis for comparison between approaches with respect to the scope of the concept (in meaning and referent), the pedagogical strategies prescribed and the underlying epistemology: it acts as a framework of reference to locate the form taken by critical thinking as an A level.

Epistemology and depth in Moon

The most distinctive contribution made by Moon comes from her attention to matters of epistemology and depth

> *We will show that epistemology and the work on critical thinking are closely related and that epistemological issues need to be taken into account in a definition of critical thinking and its pedagogy…The term epistemology is used here to relate to the learner's view of the nature of knowledge – we talk of a learner's 'conception of knowledge' or 'epistemological belief' synonymously.* (Moon 2008: 96-97)

Moon's starting point closely resembles that of the current author in highlighting the interdependent nature of conceptions of critical thinking and epistemology. However, the approach Moon takes to this relationship diverges markedly from that proposed here (sections 3.2.4 and 3.4.3). Moon's discussion focuses exclusively on 'developmental epistemology' and is derived from psychology. It locates issues pertaining to epistemology in the realm of individuals' cognitive development. This contrasts with a philosophically and sociologically derived approach which treats epistemological models

as theories available in public discourse which are in turn grounded in particular historical and social conditions. In sum, Moon's characterisation derives from her constructivist approach and contrasts with the social constructionist perspective adopted here (a distinction developed in section 4.2.2).

Moon's account of developmental epistemology is based on the work of a range of researchers – Perry, King and Kitchener, Baxter Magdola, Kember – each of whom offers a different model of developmental stages (9,7,4 and 2 stage models respectively). Moon endorses Kember's distillation of epistemological domains down to two core forms. These are a dualist position which rests on the "reproductive belief" that objective knowledge is purveyed via expert authorities and apprehended by the subjective consciousness of the learner; and a relativist position which stresses the role of subjectivities in the construction of knowledge and the learner's judgements on evidence. These two forms are seen as two ends of a spectrum which is represented more fully in Baxter Magdola's description of "four domains of knowing and reasoning" (p.103): *absolute knowing* which entails a belief in certain knowledge; *transitional knowing* where there are doubts over the certainty of knowledge; *independent knowing* where uncertainty is recognised as the norm and differences of opinion encouraged; *contextual knowing* which recognises that standards and relevance of evidence are context derived and knowledge constructed. Although Baxter Magdola suggests students move between these domains according to the purpose and topic of study, Moon claims it can be conceived of as a "continuum of development of conceptions of knowledge that is relevant to higher education" (p.102). She suggests that there is a natural sequence to the development of epistemological beliefs and considers potential pedagogical implications in the planning of courses, the compatibility of staff and student conceptions of knowledge and in the management of groups of students with different epistemological stances. Moon cites sources (Meyers, Kember) that equate these developmental stages with levels of epistemological belief, defining and confining critical thinking to the most advanced epistemological levels: "critical and creative thinking is only possible if relativism is recognised" (p.105).

It is out of the combination of the notion of epistemological stages and levels that Moon's concept of depth in critical thinking is developed. The more advanced stages are the higher levels and depth of critical thinking is indicated by ability to adopt and represent a view of knowledge that is relative and contestable. Moon suggests there has been a gap in theorising the application of depth criteria to critical thinking. To rectify this she adapts Entwistle's (1983) concepts of deep and surface approaches to learning, with a continuum from more analytical thinking which involves personal synthesising of material and ideas (deep), to superficial and descriptive commentaries (surface) (2008: 114). From this she develops a "framework for critical thinking and its representations" (pp.198-

201) which she claims "could be turned into a set of assessment criteria for a designated level of critical thinking" (p.120). Moon illustrates how the layers of depth can inform descriptors of assessment levels used to interpret levels of competency (pp.198-201). She also suggests they can and should be used in "writing modular learning outcomes" (p.125, p.219).

Moon raises important considerations for the identification and assessment of critical thinking, and her claim that critical thinking reflects a higher epistemological level is consistent with Entwistle's equivalent claim for a deep approach to learning (1991). There is some indication of the significance of relativist epistemological awareness in the highest level of assessment in Moon's 'framework for critical thinking' ('Critical thinking 2'):

> *The account shows deep reflection, and it incorporates the recognition that the frame of reference or context within which the issue is viewed, could change and affect the conclusion.*
>
> *A metacognitive stance is taken (i.e. there is critical awareness of the processes of critical thinking in themselves).*
>
> *The account may recognise that the issue exists in a historical or social context that may be influential on the response to the task. In other words, multiple perspectives are recognised and taken account of.* (2008: 200)

However, some of the descriptors appear to draw on conventional assessment criteria such as "there is an introduction to the issue" and "the selection of evidence for examination is appropriate and sufficiently wide ranging" (p.200). At the third highest assessment level of four ('Critical thinking 1') it is difficult to discern anything distinctly pertaining to critical thinking as the indicators include items such as

> *The material is subjected to reflection and consideration in relation to the task*
>
> *The existence of several alternative points of view may be acknowledged*
>
> *The conclusion is based on evidence in the text*

At the lower levels, 'not yet critical thinking', descriptors convey conventional academic criteria for poor performance such as "there is no real argument"; "ideas…are not considered in depth"; "a conclusion may either not be properly drawn, or it is drawn but is not justified by the text. It may be opinion and unrelated to any reasoning in the text" (p.198). These could equally well represent limitations to the quality of work assessed against criteria derived from a positivist or fallibilist epistemological standpoint rather than the relativist one Moon is committed to, and there is confusion between general quality

indicators and levels of critical thinking, which she defines in terms of stages of epistemological development. What she proposes is a broad assessment framework for HE study rather than specifically a 'framework for critical thinking', yet it does not encompass "other issues relevant to the quality of critical thinking other than deepening it…e.g. breadth of knowledge" (p.119) that Moon herself identifies as relevant. Moon acknowledges that this framework of critical thinking depth is expressed in terms most applicable to assessment of academic writing and that "not all the elements…are relevant to each and every critical thinking activity or task" (p.118). As there is no equivalent acknowledgement that criteria may vary according to the field or discipline concerned, there appears to be a presumption that generic standards of critical thinking can be applied to and through the work done on different courses of study.

Underpinning Moon's analysis is an uncritical acceptance of and commitment to the notion of linear development of epistemological beliefs. The progression through levels is presented as if it is a sequence experienced on commencing higher education study and which approaches its zenith with the move onto postgraduate study. Moon implies the stages of epistemological development are an outcrop of general cognitive development. This is seen in part to be contingent on human interactions such as the epistemological positions presented and encouraged by lecturers; however it is also portrayed in behaviourist terms, "learners in contact with appropriate stimuli progress along it [the epistemological continuum], albeit in a 'back and forth' manner" (p.105). Elsewhere Moon claims that "the mental processing of critical thinking is limited by the structure of our brains and the manner in which they function" (p.63). Whilst in principle this is a biological truism, it leads to a deterministic model of developmental psychology which cannot be justified in terms of the evidence provided. The proponents of models of developmental epistemology cited base their categorisations on interviews with students whose statements are taken as indications of the existence of different frames of reference regarding knowledge and thus to demonstrate differences in personal epistemological beliefs. However, at the same time these differences in beliefs are explained by reference to the individual's stage of epistemological development. There is no independent proof of the existence of the stages and the reasoning is tautological. What we actually have are retroactive categorisations which represent the writers' varying attempts to make sense of the epistemological outlook of their learners.

Because the research referred to is largely based on higher education students, there is no consideration of the epistemological tendencies of people before, after or outside of the context of higher education. There is no indication or acknowledgement of pre-higher education 'stages' of epistemological competence and no connection to holistic views of child to adult cognitive development. It is simply asserted that "most students in the early stages of their higher education are unlikely to be able to think critically in the full sense

because of their inadequately developed epistemological beliefs" (p.111) and this leads on to the conceit that "'true' critical thinking is a process in which few undergraduates can engage" (p.111). It is contended here that what Moon describes as stages are *different* in a paradigmatic sense rather than a hierarchy of inferior to superior conceptions of knowledge that all students should and do move through. Moon reproduces 'march of progress' thinking (Hegel 1953, on the advancement of reason through history) in relation to a concentrated period of cognitive development, and suggests a questionable equivalence between 'relativistic' and 'sophisticated' (Moon 2008: 107). When considered closely the relativist position she advocates as the epistemological pinnacle means little more than celebrating and taking confidence in differences of opinion, whether that be, for example, different interpretations of a text or a set of experimental data. Thus she supports the development of learning from "absolute knowing – knowledge is right or wrong – to the notion that knowledge is a matter of opinion – to the recognition that there can be different views of knowledge because it is constructed" (p.110). This relativism is essentially subjectivism. It reflects a *constructivist* tradition (Crotty 1998: 57) which stresses that meaning is attributed to the world through subjective mental processes. This is itself dualist thinking as it rests on the subjective/objective distinction, prioritising the former where, for instance, empiricism prioritises the latter. An alternative *social constructionist* position is suggested in a quote from Eisenschitz (Moon 2008: 75-6), but this distinction is not recognised or taken up in Moon's own analysis. This perspective recognises the importance of power in the determination of prevailing conceptions of knowledge and the allied ideological processes and effects. In this view the very constitution of what is perceived as the objective world is a theoretical construct rather than an extant realm which can be viewed differently from different subjective perspectives. At the same time the subjective is only realised through its objective referencing (as in Wittgenstein's concept of language and Foucault's of discourse).

Moon presents a seamless continuum of epistemological development when it is arguable that there are fundamental disjunctures between the epistemological positions described: Guba and Lincoln note the incommensurability of positivist/post positivist epistemological positions with those of constructivist and critical theorist stances (2008: 258). Moon and the developmental psychologists appear to conflate the epistemological capabilities of learners with the expectations established by the conventions of presentation of their own discipline through the metanarrative of developmental psychology. It is implausible that sociology, philosophy or literature students would be deemed capable of relativistic thinking only once they reach the postgraduate stage, when the social construction of knowledge is integral to their disciplines at any level of education. In contrast Bailin *et al.* suggest that

> *teaching critical thinking is best conceptualised not as a matter of teaching isolated abilities and dispositions but rather as furthering the initiation of students into complex critical practices that embody value commitments and require the sensitive use of a variety of intellectual resources in the exercise of good judgement.* (1999b: 298)

For Bailin *et al.* this is a gradual process in which the educator's task is to refine critical judgement capability and to empower self conscious critical thinkers, instilling these habits of mind from the earliest stages of education.

Moon makes a valuable contribution to elucidation of the concept of critical thinking by drawing attention to epistemology. Her description of criteria for judging higher level critical thinking gives an indication of what may be missed when the scope of critical thinking is constrained by 'pre-relativist' epistemologies. Unlike these approaches, she brings the constructed and ideological character of knowledge into scope for critical appraisal. However, she equates critical thinking loosely with a particular subjectivist form of relativist epistemology. In deeming this to be a higher concept of knowledge she conflates critical thinking with 'superior thinking'. Whilst raising epistemological concerns in the context of deriving and devising assessment criteria for the depth or quality of critical thinking, Moon neglects to pay attention to the epistemological position of the various advocates of critical thinking she cites, with the exception of a somewhat confused discussion of what she describes as the 'logic' approach. She presents her framework as something that is complementary to and which extends the accumulated body of critical thinking skills and dispositions described by others rather than as an alternative conception of it. There is tacit acceptance of the idea of a unified 'critical thinking tradition' in her extensive accumulative definition of the concept (2008: 126-7), despite her apparent dismissal of the epistemological primitivism she associates with the pre-relativist thinking they reflect. In moving towards an all encompassing conception of critical thinking, Moon loses the clarity of distinction Barnett offers in differentiating critical thinking, critical thought and critique (1997: 16-18). While for the most part she persists with the term critical thinking to embrace all aspects of critique or criticality, she also suggests that "true critical thinking resides in the brain" (Moon 2008: 125) thus reducing a process imbued with social meanings to a physiological function. She recognises that what she is really describing is "generic critical ability" (p.125) but by persevering with 'critical thinking' as a descriptor she effectively accedes to and endorses the rhetorical power of a term which she notes is "clearly a good and impressive term with some gravitas which is the stuff of missionary zeal" (p.7). Moon's reworking of the concept is ultimately driven by a desire to justify a way of conceiving and devising sets of learning outcomes and assessment criteria and reflects what Furedi (2004) described as "the auditing imperative" of an increasingly instrumentalist higher education (section 2.3.4). In

its generic approach to thinking skills, its unreserved advocacy of postmodernist relativism and its technical instrumentalist concern with measuring outcomes, Moon's approach embodies a range of characteristics that match the forms of thinking skills assumed and criticised by Young and the social realists.

3.4.3 Consistency, compatibility and conflict in concepts of critical thinking

The scope of concepts of critical thinking ranges widely from the position of those who see it in terms of argument analysis and other reasoning skills (A. Fisher), to those who see it as the application of a higher level of epistemological awareness (Moon). However, there is general agreement that critical thinking comprises a combination of skills and dispositions and that standards are required for judging its effectiveness. Skills and dispositions are mutually dependent as critical thinking will lie dormant unless there is a disposition to utilise the skills, while skills are needed to effect dispositions. There is also common agreement on the *desirability* of critical thinking, which is thus driven by an ethical imperative. To engage in reasoned argument is to test the boundaries of asserted belief and critical thinking provides a means of assessing the justification for cases made. The kind of reasonable, open dialogue it supports is seen as integral to the operation of democracy and to social survival and progress and it is therefore an "epistemological virtue" (Shulman 2004: 321).

There is apparent consensus on the *inevitability* or *necessity* of critical thinking under the social conditions of late modernity. Paul and Elder refer to the 'swiftly changing' nature of 'new global realities' associated with the 'post-industrial world order'. In their view there are significant 'implications for thinking and learning' in an 'increasingly complex' world with 'rapid technological advancement': "Traditionally, our thinking has been designed for routine, for habit, for automation and fixed procedure" whereas now we face new problems that require "radically different forms of thinking, that is more complex, more adaptable, and more sensitive to divergent points of view" (2002: 1). In the face of the growing influence of propaganda, surveillance and the mass media, they see increasing need for critical thinking, individually and socially, but it won't happen automatically. In Browne and Keeley's words:

> *As the complexity of the world seems to increase at an accelerating rate. There is a greater tendency to become passive absorbers of information, uncritically accepting what is seen and heard…too many of us are not actively making personal choices about what to accept and what to reject*. (2007: x)

For Paul and Elder the skills and dispositions of critical thinking are essential to an active critical response while Barnett invokes his stronger concept of critical being, combining critical thinking with critical self reflection and action.

Whilst there is common agreement that critical thinking has a vital role to play educationally and socially, there is much less consistency on how this is best achieved. There is discrepancy in how the 'age appropriateness' of critical thinking development is viewed. Barnett acknowledges that it could be claimed that all education should develop critical reasoning capability but argues that higher education has the responsibility for the highest level of critical engagement and is in a unique position in preparing adults for "living purposively with uncertainty" (1997: 177). Moon (2008) equates the development of 'genuine' critical thinking specifically with higher education, describing layers of critical thinking that are expected and accrued through its different stages and culminating in a pinnacle at the postgraduate stage. This is consistent with the view of Rorty that

> *primary and secondary education will always be a matter of familiarising the young with what their elders take to be true, whether it is true or not. It is not, and never will be, the function of lower level education to challenge the prevailing consensus about what is true.* (R. Rorty 1999: 118)

Contrary to this, McPeck associates the development of critical thinking more broadly with adolescents and young adults as he links critical thinking to the stage at which young people engage with specific subjects in secondary education onwards. Dewey saw reflective thinking as a natural extension of infant 'trial and error' in language, thought and development. He was concerned with the education of the child and with lifelong learning. The idea that thinking skills are integral to child centred approaches to learning is found in works targeting critical thinking at the earliest stages of formal education (R. Fisher 1990; Costello 2000). Costello links critical thinking to skills in argument, which are "central to the educational enterprise" (2000: vii). Her justification for this is couched in instrumental terms as children later have to "write essays, argue a case, debate, conduct small group discussions and operate in other forms of spoken and written argument" (2000: vii) and she also notes that it is important preparation for citizenship. R. Fisher sees critical thinking as "learning how to question" and "learning how to reason" (1990: 66) and he notes (p.80) how foundations of logical reasoning can be laid at a pre-school age by labelling attributes of things; comparing similarities and differences between classes of things; distinguishing some/all categories; understanding if…then logic and causal connections; ordering things according to criteria like size or age. He shows how syllogisms and classification diagrams (Euler and Venn) can be incorporated into teaching. Given that these same reasoning skills form the basis of programmes aimed at students in post compulsory and higher education (Scriven 1976; Butterworth

and Thwaites 2005), this illustrates how critical thinking may be best seen as a way of looking at things which can be encouraged and developed using materials differentiated by age, rather than as a facet of a particular development stage.

A summary overview of characteristics of critical thinking in key references cited is given in Table 3. This representation demonstrates the broad alignment between epistemological paradigms, features of the concept adopted and pedagogical preferences. Those in the informal logic movement working within a (post) positivist paradigm regard knowledge context as secondary to the application of generic critical thinking skills and favour discrete or infused pedagogies (Table 3, *pink* shaded area). Underpinning this framework is the Deweyan notion of an inquiry based approach to knowledge, conceived in terms of a continuous testing out of ideas following the principles and procedures of reason and science. While for some this entails a search for objective and indisputable truth (Bowell and Kemp 2005), most adopt the fallibilist approach taken by Dewey and recognise that knowledge can never be complete or certain. From this post positivist position critical thinking should be taken up continuously in the service of sharpening the capacity to challenge evidence and reasoning to ensure the 'best' knowledge available.

Ennis provides the most comprehensive outline for a core programme of skills and dispositions for critical thinking and suggests it could either form the basis of a discrete course or provide a framework for developing thinking skills 'infused' across the curriculum (1987). For A. Fisher a discrete course is essential as otherwise the focus on relevant skills development is likely to be neglected (*cf*. Casey *et al.* 2006 on key skills). Following Dewey, others have argued for a common programme or approach to be taken across different subjects. There is a preference for this 'infusion' in the literature on programmes for younger children (McGregor 2007) and Quellmaltz illustrates how a standard approach could be taken across science, English Literature and social science courses (1987: 91). Research on the relative effectiveness of segregated or infused teaching is inconclusive (Sternberg 1987: 254). Whatever the preferred methodology, those associated with the informal logic movement begin from the premise that

> *There are cognitive processes that can justifiably be labelled 'critical thinking', largely independent of intellectual or practical contexts. It may be accepted that contexts are necessary for the deployment of critical thinking, but it is still considered that the strategies that take the title of 'critical thinking' can be identified* sui generis. (Barnett 1997: 16)

It is the idea of a common set of generally applicable reasoning skills that characterizes the approaches derived from the informal logic movement and which determines the

Table 3 Comparison of concepts of critical thinking

	Scope of critical thinking						**Curriculum implications**		**Epistemology**
Key contributors	*skills*	*dispositions*	*knowledge context*	*problem solving/ decision making*	*criteria/ standards of judgement*	*ethical imperative*	*Pedagogic preference**	*Education/ development stage*	*Approach to knowledge/epistemological paradigm*
Dewey	/	/	/	/		/	Segregated *and* infused	All**	Fallibilist/multi paradigmatic
Ennis	/	/		/		/	Segregated or infused	All	Positivist
Paul & Elder	/	/	x	/	/	/	Segregated	Higher & lifelong learning	Fallibilist
A. Fisher	/	/	x	/			Segregated	Late secondary/higher	Fallibilist
Lipman	/	/	x	/	/	/	Segregated and infused	All	Fallibilist
McPeck	/	/	/		/	/	Discipline specific	Secondary/higher	Social constructionist
Bailin et al.	x	/	/		/		Discipline specific, infused, segregated	All	Social constructionist
Barnett – criticality	x	/	/	/	/	/	irrelevant	Higher	Social constructionist
Moon	/	/	/	/	/	/	Infused	Higher	Relativist

**Segregated* means teaching generic critical thinking skills on a discrete, standalone basis, separate from subject teaching; *Infused* describes an approach which recognises generic critical thinking skills but advocates their teaching and development through other subject teaching; *Discipline specific* refers to the contention that critical thinking can only be developed effectively in the context of the conventions of particular subjects.

***All* includes education from the primary stage to higher education and adult lifelong learning.

/ = specifically included x = specifically excluded; shading of entries indicates broad differences in epistemological positions.

pedagogical content of what is taught in the name of critical thinking whether in a discrete course or within subjects.

Those within the social constructionist paradigm (Table 3, *blue* shaded area) emphasize the importance of knowledge context to the application of critical thinking and thus favour inclusion of discipline specific pedagogical realizations. Barnett portrays Ennis as a proponent of a context independent methodology and McPeck as a proponent of a context dependent model. This misrepresents Ennis's views as he specifically indicates that his taxonomy could inform either a discrete or an infused approach (1987: 25). Furthermore Barnett conflates this methodological distinction with a more fundamental disagreement about the nature of what constitutes critical thinking. The substantive difference is that Ennis proposes critical thinking as a generic set of skills and dispositions (akin to Barnett's 'critical thinking'), while McPeck argues that the skills and standards themselves are subject specific (akin to Barnett's 'critical thought'). This difference is reflected in Table 3 by use of the designation 'discipline specific' to emphasize that the very criteria for warranty can themselves vary across subjects; this is a stronger notion of 'context dependent' critical thinking than that assumed in an 'infused' pedagogy. The idea of a discipline specific pedagogy is conceived quite differently by McPeck and Bailin *et al*. For McPeck a subject well taught will by definition engage learners in critical exploration of its concepts and theories so there is no need for explicit critical thinking teaching, the student simply needs to be immersed in learning as "the so-called thinking skills are an inherent part of the warp and woof of the various disciplines, and must, therefore, be taught as part of them" (1994: 116). Bailin *et al.* state explicitly that there is a need to articulate the key features of a critical approach to the discipline and to identify and direct activities towards these within subjects, otherwise an 'immersion' approach is likely to leave critical thinking potential undeveloped. Bailin *et al.* also warn against reliance on a discipline specific or infusion approach on the grounds that this restricts the object of critical thinking to school subjects and misses other important spheres of ethical and life decision making (1999b). They therefore advocate more diverse curriculum forms than McPeck for the reach and impact of critical thinking to be maximised, as do Johnston *et al.* (2011).

Barnett dismisses the context-specific/context-independent distinction as an instrumental preoccupation with how best to boost students' cognitive achievements. In developing his thesis about the purpose of critical thinking, Barnett appears to diminish the significance of its engagement with knowledge (labelled the first domain of criticism) whilst elevating the importance of critical self reflection (the second domain) and the extension of this into the world through critical action (the third domain). Within his broader concept of criticality, Barnett nonetheless ascribes the term critical thinking to the knowledge domain. McPeck suggests that any definition of education includes

'acquisition of knowledge', where knowledge is defined as justified true belief. As critical thinking is needed to sort relevant premises and evidence in a subject, "knowledge entails critical thinking" (1981: 34). Contrary to Barnett, it is suggested that the Ennis-McPeck axis should not be summarily dismissed as it reflects significant differences in underpinning epistemological positions and hence in conceiving the relationship between critical thinking and knowledge.

3.5 Chapter summary

The chapter has given an overview of the derivation of the concept of critical thinking and describes variations in its scope, constituency and epistemological underpinnings. It facilitates identification of the forms of critical thinking assumed in the curriculum theories described in Chapter 2, and provides a basis for interpreting the realisation of critical thinking in its A level form (Chapter 5).

The genealogy of the concept of critical thinking straddles the major philosophical traditions of rationalism, empiricism, positivism and post-positivism. Modern conceptions derive from the work of Dewey and the critical thinking movement is virtually synonymous with the informal logic movement. Its core function is to provide a test of the conditions for knowledge through scrutiny of the operation of reasoning and evidence. Knowledge is typically conceived in fallibilist terms as provisional and tentative and to this extent shares the approach of the social realists (section 2.3.2), yet critical thinking is rejected by this school of thought. The point at issue is the claim to 'universal reasoning' which characterizes the dominant model of critical thinking associated with the informal logic movement. It has been shown that an alternative 'field dependent' concept of knowledge derived from Toulmin has been influential on both the social realist school and the approach to critical thinking of, for example, McPeck (1981), Bailin *et al*. (1999), Johnson (2010). It follows that in place of blanket rejection of thinking skills approaches, a revised and more refined view of the relationship between social realism and critical thinking is both possible and desirable.

The array of pedagogical, conceptual and epistemological positions outlined in this chapter provides a framework of reference for interpretation of critical thinking as realised in the curriculum. The basis of this is made explicit in Chapter 5, which considers the extent to which the paradigm represented by the informal logic movement has shaped policy espoused and enacted and defined the scope of critical thinking as it has emerged in its A level guise. The characteristics of this curriculum manifestation of critical thinking are then discussed in relation to the social realist analysis.

The next chapter outlines the methodology adopted to bring a focus on the experiences of those engaged in curriculum practices described as critical thinking in order to inform discussion of the value of critical thinking and its relationship to knowledge. Chapter 5 focuses specifically on A level Critical Thinking and reports the findings of the primary research. The relationship between concepts of critical thinking, curriculum theory and epistemology are explored fully in application to A level Critical Thinking in a synoptic discussion in Chapter 6.

Chapter 4: Methodology

4.1 Introduction

This chapter gives an account of the research design, strategies and methods adopted to address the research questions of the study. It aims to extend beyond description and contextualizing of methods by engaging critically with the notion of inquiry paradigms. In proposing a realist methodology, it is suggested that the practice of mixing methods from across quantitative and qualitative paradigms can be extended to mixing broader design features. The chapter should also be read as dialectically interwoven with the substantive content of the thesis as epistemological considerations raised here have a direct bearing on the analysis of concepts of critical thinking and their characterization in curriculum theory. The argument for differentiation between social constructionism and social constructivism is particularly germane to the central thesis.

4.2 Research Design

4.2.1 Concerning design

The research design is primarily concerned with ensuring the selection and collection of data which is conceptually and theoretically relevant and significant to the main research questions, in keeping with Yin's position that "a research design deals with a *logical* problem and not a *logistical* problem" (2003: 21, original italics).

Robson notes that designs are not always fixed in advance and that "modification is more feasible with some research strategies than with others" (2002: 80). In qualitative research, focussed on exploration of meanings rather than hypothesis testing, design will not be a static plan but an evolving route for the research journey: "Qualitative research design has an elastic quality…it is adapted, changed and redesigned as the study proceeds" (Janiseck 2000: 395). Robson advocates "design *throughout* the project" (2002: 80). Creswell encapsulates this holistic notion of research design as

> *The entire process of research from conceptualising a problem to writing research questions and on to data collection, analysis, interpretation, and report writing* (2007: 5)

In addition to this sequential holism, Creswell also views design as multi-dimensional: whether it is conceived as a stage of research or as an overarching rationale for the process undertaken, he claims it "involves the interaction of philosophy, strategies of inquiry and specific methods" (Creswell 2009: 5).

The overall orientation of this research matches the qualitative approach Creswell describes as “a means for exploring the meaning individuals or groups ascribe to a social or human problem” (2009: 4). The designation qualitative is not universally accepted: Erickson (1986) prefers the term *interpretive*; Cohen *et al.* (2007) use *interpretive* interchangeably with *anti-positivist*, while Taylor and Bogdan (1998) prefer *phenomenological* as an overarching category. Despite these lexical alternatives there is a semantic equivalence throughout the different incarnations of a qualitative approach (Denzin and Lincoln 2000: 1-28), each sharing “a central interest in human meaning” (Erickson 1986: 119). Holstein and Gubrium suggest a “foundational principle” of interpretivism is that “human consciousness actively constitutes the objects of experience” (1997: 138) and “subjectivity is paramount as the scientific observer deals with how social objects are made meaningful” (p.139). This extends to recognition that the researcher is involved in “making interpretation of the meaning of the data” (Creswell 2009: 4).

From the outset the research was conceived as being primarily *theoretical* in focus, designed “to develop some theoretical insights by means of a critical review of literature” (Silverman 2005: 302). This involved exploration of the origins of and variations in the concept of critical thinking and relating these to epistemological assumptions and concepts of knowledge. Critical reading, review and cross-relating of corpuses of relevant literature was central to the thesis (section 1.3.1, figure 1.2). It was necessary to undertake this first in order to clarify and delineate the nature of the ‘problem’ and to refine the aims of the research. Use of the academic literature involved data selection, analysis and interpretation which was essential for mapping the conceptual terrain. This enabled more specific points of issue to be arrived at through a process of “progressive focussing” (Stake 1995: 22) and a relevant empirical pathway to be added to the theoretical focus by seeking the views of a sample of those doing Critical Thinking A level on their experiences. These views could then be compared with theory espoused and policy characterized (section 5.4). The empirical strand of the research serves the purpose of illuminating, checking, refining and extending the theoretical and conceptual issues identified, and provides a test of generalizations from curriculum theory.

The adoption of a qualitative approach in this study can in part be related to preferred philosophical worldview (section 4.2.2) but is primarily determined by the fit with the nature of the problem identified. The design approach is an orientation which is integral to the way the issue has been conceived, conceptualised and formulated both in the first instance and in its developed form through the thesis. An indication is given of the evolution of the logic of enquiry from initial conceptions of the research problem to the developed thesis, with attention to both the methodological perspective adopted and the

strategies and methods deployed. The research process is imbued with a qualitative design imperative and matters of methodology and substantive content are closely intertwined.

4.2.2 Situating the research by 'inquiry paradigm'

A methodological perspective is a framework of values and beliefs about the nature of reality (ontology) and knowledge (epistemology) that guides all aspects of research from conceiving of a research problem to designing and implementing a strategy for data collection and analysis. This is referred to variously as a 'philosophical worldview' (Creswell 2009: 5), a 'model' (Silverman 2005: 9-11, 98), an 'inquiry paradigm' (Guba and Lincoln 2008: 257). The variation in nomenclature is accompanied by a diverse range of category alternatives as indicated in Table 4.1:

Table 4.1 Inquiry paradigms (selected authors)

Creswell	**Silverman**	**Guba & Lincoln**
Postpositivism	Positivism	Positivism
Constructivism	Constructionism	Postpositivism
Advocacy/participatory	Emotionalism	Critical Theory *et al.*
Pragmatism	Functionalism	Constructivism
	Feminism	Participatory
	Behaviourism	
	Interactionism	
	Ethnomethodology	

Sources: Creswell (2009: 6), Silverman (2005: 9-10, 98), Guba and Lincoln (2008: 262)

While there are similarities and overlaps in the categories listed, the degree of variation suggests there is not an agreed basis for the selection of paradigm choices and, indeed, numerous alternative paradigms might be considered, such as structuralism, post structuralism, postmodernism, action theory, relativism, critical realism, and so on. The absence of agreed referents suggests either the provisional and tentative status of paradigm descriptors; different notions of what constitutes a methodological perspective, for example Silverman's categories of functionalism and feminism assume a particular model of social order as well as sets of assumptions about the nature of reality and knowledge creation; or attempts to extract and abstract meaning from research and knowledge creating practice and to attribute order by superimposing designated paradigm categories. Thus, despite distinctions drawn between paradigms on the basis of stipulated criteria (Guba and Lincoln 2008: tables 8.3/4/5), there is a degree of arbitrariness to those put forward.

Guba and Lincoln themselves note the fluidity of categories, resulting from their shifting designations and characteristics (2008: 264). Furthermore they claim that

> *there is great potential for interweaving of viewpoints, for the incorporation of multiple perspectives, and for borrowing, or* bricolage*, where borrowing seems useful, richness enhancing, or theoretically heuristic.* (Guba and Lincoln 2008: 259)

However, this apparent advocacy of a creative intermeshing of paradigmatic features is illustrated exclusively in terms of borrowings across non- (post) positivist paradigms. These are deemed "incommensurable with positivist forms" (p.262, table 8.5). Effectively Guba and Lincoln distinguish between the 'mature' paradigm (Kuhn 1970a: 178-9) of the positivist tradition, including post positivism, and the emerging paradigm that they variously describe as a "nonpositivist" orientation, "qualitatively oriented" approach or "new paradigm" (pp. 255-6). In the latter "pre-paradigm" position "a number of different schools compete for the domination of a given field" (Kuhn 1970a: 178). Denzin and Lincoln characterize these 'interpretive paradigms' according to seven 'moments' or phases (2000: 1 – 28). The other paradigms described by Guba and Lincoln are in effect subsidiary positions within the two overarching paradigms.

In considering the methodological perspective adopted here, it is contended that *bricolage* can extend to borrowings across the main paradigms as well as from different positions within them. The research process followed is inquiry driven and pragmatic rather than governed by ideological commitment to a particular paradigm. The current reflections on methodological perspective represent a retrospective sense making rather than an explicitly formulated *a priori* position. This approach appears to be at odds with that of Silverman who recommends that researchers

- *Always begin from a theoretical perspective or model*
- *Choose between methods and data which will give you an account of structure and meaning from within that perspective* (Silverman 2005: 122)

In this view the initial paradigm commitment is a shaping force for the whole research process and there is an assumed unity of paradigm, methodology (qualitative or quantitative) and methods. The alternative position taken here is that the topic of research and the specific aims and questions formulated are the key determinant of methods of data collection and analysis chosen: "the ultimate test should be the utility of the methods in helping to achieve overall research objectives" (Clark and Causer 1991: 171). However, contrary to the post positivist approach taken by Clark and Causer, it is acknowledged that the perception and definition of issues to be researched itself reflects

underlying ontological and epistemological beliefs. In other words, the starting points are themselves socially constructed rather than empirically given.

Comparing the current research to the paradigm positions summarised in Guba and Lincoln (2008: tables 8.2, 8.4), its features most closely resemble those they describe as constructivism. The starting point for the research was a desire to understand the meaning of concepts of critical thinking as encountered in a range of educational contexts, rather than to establish explanatory relations through hypothesis testing as in (post)positivist approaches. This constructivist focus on "understanding and reconstruction" was pursued through literature search and interpretation that identified a prevailing critical thinking orthodoxy derived from the informal logic movement. This was supplemented by attention to "structural and historical insights" as characteristic of a critical theory approach, notably in an overview of the derivation of the concept through a historical line of philosophers and in situating contemporary conceptions of critical thinking in relation to modernist assumptions. A contribution to knowledge accumulation is offered through "more informed and sophisticated reconstructions": while in Guba and Lincoln's constructivist position this probably alludes to outcomes from identification of 'members meaning making' through naturalistic research, an equivalent is achieved through textual reconstruction (rather than reportage), evident in new ways of selecting and juxtaposing material across a range of academic and policy texts, together with the proposed supplementation through the primary case study. The quality criteria for judging the value of the research matches that associated with critical theory, "erosion of ignorance and misapprehension", as well as the constructivist emphasis on "authenticity", for instance in testing whether curriculum theorists' views of critical thinking "related to the way others [learners] construct their social worlds" (p.271). The stance of this inquirer is constructivist and participatory in facilitating "multivoice reconstruction" and in using "secondary voices in illuminating theory" as it elicits the views of practitioners as well as experts (p.271).

Given the overall match between features of the research and those Guba and Lincoln associate with a constructivist approach, it is perhaps surprising to find use of methods which would normally be associated with a quantitative approach taken from a (post)positivist paradigm. While a case study strategy was adopted, the methods used included a questionnaire and an adapted nominal group technique. In explaining these choices (section 4.3.2), an indication is given of a qualitative influence in aspects of the data sought (free writing in answer to open questions in the questionnaire; group discussion following from the numerical outcomes of the NGT): the core focus on participant meanings was retained. The methods were chosen to inform questions arising from literature review and in this respect reflect pragmatic concerns, with the key driver being relevance to research questions rather than "allegiance to any single

epistemological perspective", on the premise that "methods can be separated from the epistemology out of which they have emerged" (Patton 2002: 136). Guba and Lincoln acknowledge that "mixed methodologies may make perfectly good sense" (2008: 265) and that paradigms do not entail "exclusivity of methods" so "there are many opportunities for the naturalistic researcher to utilize quantitative data" (p.266). While Silverman appears to advocate methodological purism, "different theoretical idioms or models provide different justifications for using particular research methods" (2005: 123) he nonetheless acknowledges that choice of method should reflect research topic as well as methodological preferences (p.122).

Constructivism and constructionism

The paradigm preference evident in the non positivist and particularly constructivist characteristics identified by Guba and Lincoln is a reflection of personal background and beliefs as a sociologist educated in anti positivist schools of phenomenology, interactionism, ethnomethodology and social constructionism. Consistency with some attributes associated with critical theory reflects a belief in the reality of structural constraints and contexts (class, gender, ethnicity) and in the compatibility of conflict models of social arrangements with a constructionist approach. The position adopted in the current research is more accurately described as social constructionist and, despite the representation of social constructionism by realists such as Moore (2007), is compatible with a realist approach that is distinct from positivist/absolutist or constructivist/relativist paradigms. The position adopted throughout the thesis is that there is a significant difference between constructionism and constructivism despite a common tendency to use them interchangeably or as synonyms; for example where Moore is critical of the relativism he associates with constructionism, Young (2008) cites constructivism when making the same critique.

Guba and Lincoln claim that "we are ourselves social constructivists/constructionists" (2008: 259) and throughout treat these as lexical and semantic equivalents. However, there is an important distinction to be drawn between constructivism as an approach derived from educational and psychological theory (Vygotsky 1978, Piaget 1970) and constructionism as a sociological approach derived from Berger and Luckmann (1971) and earlier phenomenologists such as Husserl and Schutz (Gubrium and Holstein 2003: 216-7). Constructivism concerns the individual's creation of meaning and expansion of learning through participation in discussion and dialogue. Its focus is on the subject's developing and enlarging envelope of understanding of the world and is social only insofar as this personal meaning making process is engendered through participation in social contexts and processes. Constructionism on the other hand places emphasis on the creation and maintenance of shared meanings in the form of symbolically and

practically available discourses, which entails social construction of a reality over and above an individual's consciousness. In this approach social interactions serve to institutionalise what passes as social knowledge, including social roles and identities and public language. Subjectively meaningful typifications and significations undergo a process of objectification, rendering the symbolic world real in its effect: "Institutions are experienced as possessing a reality of their own, a reality that confronts the individual as an external and coercive fact" (Berger and Luckmann 1971: 76). The difference between constructivism and social constructionism has been summed up by Crotty as follows:

> *Constructivism…points out the unique experience of each of us. It suggests that each one's way of making sense of the world is as valid and worthy of respect as any other, thereby tending to scotch any hint of a critical spirit. On the other hand, social constructionism emphasises the hold our culture has on us: it shapes the way in which we see things…and gives us a quite definite view of the world.* (1998: 58)

The distinction is epistemologically significant as constructivism "insists…that there are no neutral/factual/definitive accounts to be made of the social world" (Pawson and Tilley 1997: 21), only a myriad of personal interpretations and meanings which coincide to varying degrees. As Young and Muller state, "constructivists claimed that the only reality was that there was no reality beyond our perceptions" (2010: 114). This is an ontological subjectivism which results in constructivism reducing matters of belief to individual differences, thus leading to the relativism of postmodernism. Social constructionism, on the other hand, matches the position of realists in recognising a world real in its effect:

> *What is taken for granted as knowledge in the society comes to be coextensive with the knowable, or at any rate provides the framework within which anything not yet known will come to be known in the future. This is the knowledge that is learned in the course of socialization and that mediates the internalization within individual consciousness of the objectivated structures of the social world…It objectifies this world through language and the cognitive apparatus based on language, that is, it orders it into objects to be apprehended as reality.* (Berger and Luckmann 1971: 83-84)

The social realists prefer to describe the process of knowledge creation in terms of the *production* of knowledge grounded in the material practices of communities of experts, claiming that their approach "signals a shift from viewing knowledge in terms of construction…towards a focus on its production within relatively autonomous fields of practice" (Maton and Moore 2010: 6). However, they share the constructionist view of the social character of symbolic and conceptual knowledge and its relative autonomy and

note the power of its effect. Echoing Berger and Luckmann, it is suggested that social realism highlights

> *A concern with the* sociality *of knowledge in terms of how knowledge is created ('social') and emphasises that knowledge is more than simply produced – its modalities help shape the world ('realism'). This capacity is given by its 'objective' nature, by which is not meant its 'certainty' but rather its nature as an object in its own right that has real effects.* (Maton and Moore 2010: 6, original emphasis)

This description of knowledge from a constructionist and realist standpoint closely matches Foucault's depiction of discourses of linguistic and non-linguistic practice which are "historically and culturally located systems of power/knowledge" that "systematically form the objects [and subjects] of which they speak" (Gubrium and Holstein 2003: 224). Constructionism, like Foucauldian discourse analysis, leaves open the potential for subjective challenges to prevailing meanings, whilst highlighting the significance of power in imposing, legitimising and defending particular definitions of the situation:

> *I am interested …in the way in which the subject constitutes himself in an active fashion, by the practices of the self, these practices are nevertheless not something that the individual invents by himself. They are patterns that he finds in his culture and which are proposed, suggested and imposed on him by his culture, his society and his social group*. (Foucault quoted in Gubrium and Holstein 2003: 225)

In this respect social constructionism is compatible with critical theories such as feminist or neo-Marxist approaches. It is well matched to the views of those advocating a realist methodology:

> *Subtle realism, analytic realism …and critical realism…are all markers of an approach to social research which accepts that, although we always perceive the world from a particular viewpoint, the world acts back on us to constrain the points of view that are possible.* (Seale *et al.* 1999: 26)

It is constructionism rather than constructivism that informs the current research. There is a focus on subjective meanings in seeking learner views on the concept of critical thinking and there is also attention to the way in which the concept has been constructed and defined through the selection from theoretical texts, the representations contained in policy documents and the institutionalising of a particular approach in formal syllabus documents, assessment materials and textbooks. A particular history or 'archaeology' is suggested through the links back to the informal logic movement, Dewey and Enlightenment philosophy, together with a function defined in terms of modernist notions

of knowledge and truth. This provides a hermeneutic context for interpreting the meaning-in-use of the concept in policy enacted and experienced. The social constructionist approach taken is aligned with a social realist position as it highlights that the production of knowledge occurs in specific socio-historical contexts and also recognises that this knowledge takes on a reality which is independent of the beliefs of individual 'knowers'. It can also be seen as connected to pragmatism, despite the association of certain forms of this with an asocial, experientially based view of knowledge in some realist writing, as when Young suggests that "Durkheim argued that pragmatism collapses truth into the sensations, instincts and the consciousness of individuals" (2008: 60), yet proceeds to argue that the objectivity of knowledge is given by its social functionality, a pragmatism of the collective.

Reconciling constructionism and post positivism – Deweyan pragmatism

The methodological perspective adopted in the research has been described in terms of a social constructionist paradigm. Although quantitative methods are used as part of the case study strategy, their selection is pragmatic and the outcomes are used to inform an overall interpretive aim rather than to act as the basis for quantification and correlation as in a (post)positivist paradigm. However, the steps followed in producing the thesis are closely related to those prescribed by Dewey in relation to reflection and which he saw as akin to procedures associated with experimental science and hence a post positivist methodology. These steps were explained and contextualized in section 3.2.1 and are reproduced in Table 4.2 alongside a resume of the process undertaken in the research.

The reflection process outlined by Dewey could apply to an immediate practical problem and the rapid thought processes and actions undertaken to solve it in a relatively short timescale (imagine, for example, that the starting point was discovering a key ingredient missing part way through cooking a meal, with hypothesised solutions considered such as substituting ingredients, borrowing from a neighbour, going to a shop). In this context the same sequence of steps is followed over a much longer period tied to the expectations surrounding doctoral research. Experience is the starting point but this is not restricted to a practical obstacle encountered in everyday life, in this case it takes the form of a kind of cognitive dissonance. Even at the first stage, prior knowledge and the influence of theory are evident. Mental processes are fuelled by and extended into literature review, especially at the second stage. It is not clear in this case what comprises a solution to 'the problem' as it is a search for understanding rather than for a strategy to implement specific practical change and as such the whole thesis might be construed as an exploration relating to the second stage here. The 'solution' may be ability to rationalise or reconcile the anomalies identified or may require reformulation of the problem in terms of practical implications, for instance in terms of the most effective

Table 4.2 Resume of research following Dewey's stages of reflection

	Reflection stage	Research experience/activity
1.	Perception of a difficulty in our experience (a problem or disjuncture that cannot be explained adequately from existing knowledge)	Starting point of personal experience (section 1.1.2): perceived problematic nature of concept of critical thinking. Various dimensions to this: i.Disjuncture between expectations regarding critical thinking derived from discipline based critical evaluation and the scope and nature of critical thinking expected in AS/A level syllabus ii.Prominence of critical thinking in higher education curriculum and assessment design, and public representations, yet ambivalence towards acceptance of it as an A level subject iii.Targeting of critical thinking at high ability learners yet inclusion of it in policy proposals for new vocational diplomas aimed at all learners.
2.	Location and definition of this (identifying the precise nature of the problem)	Exploration of definitions of critical thinking in academic theory and policy espoused and related heuristics (philosophical antecedents and social context). Identification of dispute between context bound and context free conceptualisations and the basis of this in epistemological differences as well as pedagogic preferences. Positioning of critical thinking in relation to curriculum theory. Review and critical engagement with literature key to above.
3.	Suggested solution (hypothesis)	That the concept found in A level is epistemologically specific as it is tied to post positivist notions of science, knowledge and truth. That the curriculum theories of Young & Furedi lack validity in their portrayal of critical thinking.
4.	Checking this out mentally by reasoning (imagining consequences)	Check first 'solution' above by referring to a range of epistemological positions from further analysis and synthesis of literature. Check second by devising methods for capturing practitioner views.
5.	Further observation and experiment (i.e. empirical testing to arrive at a conclusion via acceptance or rejection of a hypothesis). Alternatives to be tested until a solution that works is found	Test whether critical thinking is experienced as formulaic and lacking value as curriculum theorists assert (questionnaire method). Test whether critical thinking students recognise limitations of the context free model they follow (NGT method). Test whether expectations re critical evaluation amongst curriculum specialists match or diverge from a critical thinking approach (teacher response activity).

Source: Stage descriptors adapted from Dewey (2007: 37-9)

pedagogic approach. The outcome expected from stage 5 is a more informed and refined understanding of and commentary on the cluster of issues identified in the starting 'problematic'. Described in terms of a 'hypothesis testing' model, the research appears to be structured on a model of knowledge accumulation derived from a positivist paradigm. However, the end of the process is not a set of facts or a 'true' understanding as might be claimed from this approach. Rather it increases or decreases the warrant for our beliefs, contributing to an extension to knowledge via a *truer* rather than a *true* picture (a post positivist, fallibilist position). Moreover, the pragmatic gain will be judged in terms of personal enlightenment for the researcher, the contribution to knowledge and understanding in the academic and professional community, and in practical applications identified. The Deweyan framework accommodates elements associated with constructionism and pragmatism in an apparently scientific and post positivist methodology (section 3.2.3). This is replicated in the current research, in which the underlying ontological and epistemological beliefs and the overarching research aims are grounded in social constructionism, while the procedural sequencing can be matched to a post positivist approach and decisions about specific strategies and methods have been governed by pragmatic concerns through "*toolkit selecting*, a commitment to marrying the appropriate method to the appropriate research task" (Pawson and Tilley 1997: 158, original italics). The research not only uses multiple research methods, but also draws on multiple paradigms in an inquiry led process. As such it accords with Seale *et al.'s* contention that "philosophical positions can be used by social researchers as resources for thinking rather than…as foundational" (Seale 1999: 25). The combination of theory driven process and pragmatic decision making matches Pawson and Tilley's depiction of *realist* methodology (1997: xiii, original italics) and Seale's advocacy of "pragmatic, subtle realism" (1999: 27).

The multi dimensional approach taken here goes beyond variety of research methods, drawing on features of different methodological paradigms, and bringing to bear diverse theoretical strands in the form of sociological and educational theory as well as perspectives from philosophy and psychology. This is not driven by an 'illusion' that there is a 'whole truth' to discover (Silverman 2005: 122) but rather seeks to illuminate the central concept and its significance in practice by viewing it through different lenses. As such the outcomes of the research are not a static end in themselves but raise new questions and open up new avenues for exploration. The goal is not triangulation of information to arrive at a fixed point as in a positivist search for truth, rather it can be compared to Richardson's "central imaginary" of the crystal

> *… which combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach. Crystallization deconstructs the traditional idea of 'validity' (we feel there is no*

single truth…) and…provides us with deepened, complex, thoroughly partial, understanding of the topic. Paradoxically we know more as we doubt more what we know. (2000: 934)

4.3 Research strategies and methods of data collection and analysis

4.3.1 The research aims and questions

The purpose of this study is to describe the meanings attributed to the term critical thinking in a range of expert accounts and to compare these with policy maker and participant meanings in the context of an A level Critical Thinking programme in a PCET provider, and to use these findings to inform a discussion of the applicability of the curriculum theories of Kelly, Furedi and Young. The core and subsidiary research questions were identified in section 1.2.3 and are used to structure the discussion of findings in Chapter 6. The primary research was undertaken to inform question 3. The rationale for the choice of methods and details of their construction and implementation are provided below.

4.3.2 Choice of primary research methods

The main primary research strategy took the form of a case study supplemented by an additional 'critical response' activity. The choice of this strategy and the specific methods adopted resulted from clarification of the primary research focus and from a review of evidence against Kirkpatrick's (2006) evaluation framework (Table 4.3).

While Kirkpatrick's four level model originates from a human resources management context concerned with assessment of discrete organisational training programmes, the principles are transferable to longer educational programmes. The basic level of evaluation considers the reaction of participants to their experience, whether they found it valuable or enjoyable, their satisfaction with it. Kirkpatrick suggests this does not in itself prove learning, but negative responses are likely to work against it. The second level concerns changes in attitudes, skills or knowledge which can be attributed to the programme. The third level relates to wider behavioural change; in other words the impact beyond the course itself in other areas of work and life. The final level is that of results, captured in measurable outcomes. For Kirkpatrick a true assessment of the value of a learning programme requires consideration of all four levels. Potential application of this model to student experience on critical thinking programmes is summarised in Table 4.3, with an indication of evidence sources considered and selected for inclusion in the primary research.

Table 4.3 Application of Kirkpatrick's (2006) evaluation model

Evaluation level	**Criteria in critical thinking context**	**Existing evidence source**	**Possible data collection methods (*those selected indicated in italics*)**
Reaction	Learner response, satisfaction and estimate of value of the experience.	Survey of teacher views of student attitudes and motivation (Black 2009a); survey of students' motivation (Rodeiro, referred to in Black 2009a).	Student satisfaction surveys; response to interview questions; retention and attendance data.
Learning	Acquired knowledge and skills plus attitudes – critical disposition.	Awarding body data on achievement in Critical Thinking.	*Questionnaire* or interview questions *on what students know and can do as a result of the programme, and on attitude changes;* teacher rating of critical dispositions; *direct observation of critical disposition in outcomes from and participation in NGT process.*
Behaviour	Transferability - application of skills to material on other courses; wider impact re problem solving, decision making, debating. Impact on approach to learning (deep or surface).	Relationship between Critical Thinking performance and overall A level grades (Black 2009b).	*Questionnaire or interview questions on application of skills in other subjects and in everyday life;* approach to learning inventory; *teachers' assessments of development and effective use of skills in other subjects*; demonstration of capacity to transfer skills through open ended response activity.
Results	Performance on the course and in other subjects; success in HE interviews/assessments	Exam results in Critical Thinking (BBC 2010, Black 2009a) and other subjects followed (Black 2009b); impact of thinking skills interventions on general cognitive competencies (CfL&T).	Assessment of critical thinking candidates by HE admissions tutors.

The emphasis in Kirkpatrick's model on the need to extend assessment of training programmes beyond checks on the learning resulting to the carry over into behaviour means that the model is particularly apposite when considering critical thinking. Critical thinking courses are justified in terms of the value added to learners' capacity to study effectively on other programmes and at higher levels and the promotion of a critical disposition in their lives (section 3.3). Therefore the main focus of evaluation needs to go beyond assessment of the effects of critical thinking courses on students' performance as defined by the knowledge, skills and assessment tasks specified by the syllabus itself. Attention is given to data on performance on other programmes (Black 2009b), and primary methods have been chosen to elicit learners' perceptions of the nature of critical thinking and its relationship to study on other courses. Black's research findings indicate a correlation between success in Critical Thinking and performance in other A levels, but it is unclear whether this is a causal relationship (section 5.2.4). To explore this link use of Entwistle's approaches to study inventory was considered to obtain data on the relationship between critical thinking and deep or surface approaches to learning but was omitted on the grounds that a wider sample and complex controls would be required in a separate quantitative piece of research. A further method based on nominal group technique (NGT) was added to stimulate group discussion. Although Kirkpatrick's framework is driven by performance measurement imperatives associated with a technical instrumental ideology (Young 2008) or 'aims and objectives' approach (Kelly 2004), it nonetheless reveals areas of focus for data collection that relate to participants' experience, attitudes and understanding.

4.3.3 Case study

Case studies are distinguished by their focus on a "functioning specific" identifiable as a "bounded system" (Stake 2003: 135). Depending on context this could mean an individual, an organisation, a group, a community and so on. The case study is both a process of investigating the selected case (a data collection method) and a product of the investigation (outcome of data analysis). A case study is used to test out the validity of theoretical propositions: "a previously developed theory is used as a template with which to compare the empirical results of the case study" (Yin 2003: 33). The goal is "to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)" (Yin 2003: 10). Case studies contribute to a process of generalising findings through an accumulative effect where multiple cases are considered; through their significance to the breadth and applicability of emerging theory in a grounded theory approach (Flick 2006: 126); because the case is in some sense a typification of a broader category (a "representative case", Yin 2003: 41); or as a test case checking whether a generalization holds up. In this research a purposive sample

was chosen to represent an ideal exemplar of critical thinking as implemented and experienced, with findings of potential significance in relation to generalisations concerning the ineffectiveness of critical thinking in relation to learning and knowledge (Young 2008, Furedi 2009) and also to the supposed transferability of generic skills into other areas of learning (A. Fisher 2001, OCR awarding body materials). It was chosen as the case "from which we can learn the most" (Stake 2003: 152) as it offers the best test of the theoretical propositions identified, thus matching Yin's description of a "critical case" in which "the single case represents the *critical test of a significant theory*" (2003: 41, author's emphasis).

Stake contrasts two types of case study according to the purpose behind them. An *intrinsic* study is motivated by a search for better understanding of the particular case itself rather than using the case to build theory or illustrate a concept in action. An *instrumental* case study is one in which "a particular case is examined mainly to provide insight into an issue" and may be used to check or "redraw a generalization" (Stake 2003: 137). It is the latter type which is deployed in the current research.

Stake's description of the case study as a qualitative method of research appears to be based largely on his model of an intrinsic study. It is characterised by "extended time, on site, personally in contact with activities and operations of the case" (2003: 152) and is said to involve "the observation of operations" (p.149) and is "interpretive, so emphasizes the production of meanings" (p.158). This is similar to the language and processes of ethnography

> *The conceptions of most naturalistic, holistic, ethnographic, phenomenological case studies need accurate description and subjective…interpretation; a respect and curiosity for culturally different perceptions of phenomena; and empathetic representation of local settings – all blending … within a constructivist epistemology* (Stake 2003: 149)

However, as Yin notes case studies are "not to be confused with qualitative research or ethnography…Nor need case studies take a long time" (2003: 14, 11). For reasons of practical expediency and specificity of focus, the current study is "single issue research" rather than "holistic research" (Stake 2003: 144) and involved limited rather than extensive contact with the group. Multiple methods were adopted within the study to provide different paths towards illumination of the central concerns. The issues are *etic* (externally determined) rather than *emic* (defined by the participants themselves) but nonetheless Stake acknowledges that "issues can be good research questions for organising a case study" (1995: 17). It was anticipated that the findings would be significant in "refining theory and suggesting complexities for further investigation" and in testing "the limits of generalization" (Stake 2003: 155). Rather than the case being the

object of study, it is an instrument of study in this case. The selection of the case and the methods deployed are described below.

Sample selection

The case study was bounded in that it related to critical thinking students in a specific PCET institution (East College). It was further narrowed by taking only students studying a discrete Critical Thinking course at Advanced level, with A2 students specifically as they had chosen to continue with the subject into their second year of study. The sample involved students with an explicit programme of critical thinking at A level but was not chosen to be representative of all such learners, nor was it chosen randomly. In an instrumental case study, Stake suggests that "the choice of case is made to advance understanding of something else" (2003: 137) and a purposive sample was chosen on this basis. It involved a PCET provider identified by OCR, the chief awarding body for the subject, as the top institution nationally for Critical Thinking. Whilst the criteria for this designation are not publically available from the awarding body, it is understood from a provider representative to reflect a combination of innovative curriculum practice and outstanding student results.

In certain key respects the sample taken is untypical of the subject in the sector. Students taking Critical Thinking at this provider have the full timetable time allocated for A level subjects at the institution, unlike the majority of schools and colleges which schedule Critical Thinking on significantly fewer course hours (Black 2009a: 10). Also the student intake is at best in line with general A level entry requirements for this provider and is not skewed towards students with higher GCSE grade profiles as is often the case (Black 2009a: 12-13). Given the exemplar status of the provider, with courses taught by an experienced teacher and recent examiner, it was chosen for purposes of 'typification' rather than 'typicality'. It was taken as an 'ideal realization' of critical thinking in current curriculum experience. As such it was an ideal case, unfettered by issues such as poor delivery, staff inexperience or shortage of resources, and which could provide a reliable testing ground. If the 'deficiencies' identified by Young and Furedi (section 2.3.4) are found under these conditions, then it is unlikely that this would be better elsewhere. If they are not evident, it renders problematic the sweeping generalizations offered by these theorists about the nature of the experience and significance of critical thinking in the curriculum relative to knowledge.

Case study methods

In keeping with the instrumental form of case study adopted, the methods used were designed to gather information of relevance to the specific gaps identified from theoretical analysis and from limitations to the forms of evidence available. They reflect the absence

of any empirical reference to learners' experiences of critical thinking in the curriculum theory of Young (2008) and Furedi (2009); paucity of research focussed on critical thinking in PCET (Moseley *et al.* 2004: 4); lack of reference to learners' voices in Black's (2009a) report on the introduction of Critical Thinking in the UK A level curriculum; minimal reference to learners' views in Moon's overview (2008: 23-5). It is in this context that a sample and methods were chosen to elicit data relevant to a research question on the meaning and value of critical thinking to learners following an A level course in it.

Although an overarching qualitative orientation was taken, the methods selected do not comply with the usual combination of open ended interviews and observation typically associated with the 'thick description' expected in intrinsic case studies. As Stake notes

> *Methods of instrumental case study draw the researcher toward illustrating how the concerns of researchers and theorists are manifest in the case…because the critical issues are more likely to be known in advance and following disciplinary expectations, such a design can take greater advantage of already developed instruments and pre conceived coding schemes* (2003: 140-141)

A range of methods using more structured stimulus material were deployed as a means of eliciting views on the experience of and understanding of concepts of critical thinking of a sample of those currently engaged on an A level Critical Thinking programme. The methods comprised a questionnaire and adapted nominal group technique, involving response to quotations and group discussion.

Questionnaire

The principle of *Occum's razor* was followed in seeking a simple but effective means of obtaining participants' existing views. The questionnaire (Appendix 1) contains a small number of questions, all of which are open and designed to elicit the conceptions of critical thinking held by the learners in the study and the perceptions they have of its value and applications, including in relation to study of other subjects. Care was taken to keep the number and length of questions to a minimum and to word them straightforwardly so as to encourage responses and avoid the pitfalls in questionnaire design noted by Oppenheim, such as use of leading questions, reliance on acronyms, use of 'double barrelled' or 'double negative' questions (1992: 128-130). Feedback from participants in a pilot sample led to modifications to verbal instructions and to question wording, so as to avoid overlap and repetition in responses to questions. The purpose of the questionnaire was to enable comparisons to be made between the working definitions students' hold of critical thinking and those of different theorists, and also to gauge their views on the transferability of skills and dispositions developed through study of Critical

Thinking. In capturing these aspects of policy experienced, a comparison could be made with aspects of theory espoused and policy characterised.

Use of questionnaires is usually discussed in terms of quantitative sample surveys (Oppenheim 1992) but in the context of the current research, the purpose was not to generate statistical data to act as the basis of a generalisation. Rather, the method was selected for pragmatic purposes as a means of gathering the views of those in the case study relatively quickly and with minimal potential for a 'researcher effect' to influence responses. It enabled the views of each participant to be sought on an individual basis and as these were gathered simultaneously it was much less time consuming than carrying out separate interviews. In completing written responses, the participants were able to respond on their own terms without being overtly or covertly influenced by an interviewer through interventions such as the selection of follow up questions or interpretation of non-verbal cues. Thus use of standard questions and absence of interviewer effect was designed to improve both the reliability and validity of the responses. This concurs with Cohen *et al.*'s assessment of the advantages of questionnaire over interview, "it tends to be more reliable because it is anonymous, it encourages greater honesty, it is more economical than the interview in terms of time and money" (2007: 351). The "low response rates and consequent biases" (Oppenheim 1992: 102) associated with postal questionnaires were avoided as the researcher was present and it was possible to clarify interpretations of the purpose and content of the questionnaire. Matters of literacy were not expected to create difficulties for a case study involving A level students, especially when wording had previously been trialled on a peer equivalent group. Cohen *et al.* suggest that "if only open items are used, respondents may be unwilling to write their answers for one reason or another" (2007: 352). Whether this is taken literally as writing *any* answer or to mean an unwillingness to reveal their true views, steps were taken to limit these possibilities. Emphasis on confidentiality and the value of participants' views, reinforced by support of the institutional 'gatekeeper', was intended to reduce any perceived threat in the situation (Oppenheim 1992: 104-5).

It is recognised that use of a questionnaire limits the potential to probe responses further and to check meanings behind individual responses in a way that could be achieved using a more unstructured interview approach (Cohen *et al.* 2007: 335). However, despite the claim that in-depth interviews lead to "more textured and authentic accounts" (Rapley 2004: 15), this is outweighed by the gains from using an appropriate questionnaire which minimizes the interviewer effect and enables respondents to articulate their views on their own terms. As Oppenheim notes:

> *The chief advantage of the open question is the freedom it gives to the respondents…they can let their thoughts roam freely, unencumbered by a prepared set of replies. We obtain their ideas in their own language, expressed spontaneously.* (1992: 112)

In this way the processual freedom offered by use of open questions is compatible with qualitative aspirations to capture the 'actor's viewpoint' or experience. However, Silverman suggests that the 'actors' perspective' is "a very slippery notion" and cautions that

> *Most qualitative researchers who champion the subject's point of view or privilege experience simply do not question where the subject's 'viewpoint' comes from or how 'experience' gets defined the way it does by those very individuals whose experience we seek to document.* (2004: 343)

It was anticipated that participants' answers to the questions would reflect the concept of critical thinking built into the course materials, syllabus, exam and teaching experienced. The discourse across these is likely to frame the students' knowledge of what is meant by critical thinking and its perceived benefits and they have to 'buy into' this meaning to succeed on their course and into its value for self esteem. Although this depiction of students as mouthpieces for prevailing constructs of critical thinking suggests limits to the validity of views captured, this rests on a *naïve* naturalistic view of validity as reflection of pure, unencumbered subjective views. Of interest here is the extent to which students share in and contribute to a socially constructed conception of critical thinking, and whether they are able to generate reflective critique of this even without the stimulus of interaction with others and the provision of alternative possibilities as offered in the subsequent nominal group technique (NGT).

Whilst it is recognised that the questions themselves structure responses to a degree by pre defining the focal concerns, the open questions nonetheless create space for respondents to formulate their own thinking on the issues. In analysing this data aspects of a grounded theory approach were adopted; not in naturalistic terms as "the discovery of theory from data" (Glaser and Strauss 1967: 1) but rather as "interpretive work" (Strauss and Corbin 1998: 160) by a "theoretically sensitised" (p.167) researcher initiating "conceptual density" (p.161) in the analysis, drawing on a multi-disciplinary approach. While "the perspectives and voices of those whom we study" (p.160) are referred to, these have "become incorporated into our own interpretations (conceptualizations)" (p.174). In other words the engagement with the data is conceived in social

constructionist terms reflecting the “interactive nature of both data collection and analysis” (Charmaz 2003: 270).

The methods in the case study were deployed in a particular order, with the questionnaire completed prior to the NGT group discussion. This was so that the current state of participants’ thinking could be captured before they were prompted to think differently about the issues by the stimulus material used to lead into the group interview. The NGT was intended to stimulate discussion and meta analysis of the meaning and nature of critical thinking. In addition to eliciting the current state of participants’ views about critical thinking, the questionnaire was therefore intended to encourage reflectiveness on the part of the participants as a step towards the broader meta analysis of the NGT process.

Nominal Group Technique (adapted)

The intention of this strand of the case study research was to stimulate thinking about critical thinking which might take participants outside their everyday conceptions of the discipline and allied processes. It was anticipated that the ‘first response’ conceptions of critical thinking elicited by the initial questionnaire were likely to reflect the account of the subject enshrined in the syllabus and assessment tasks encountered, together with its reinforcement through teaching towards these and through policy espoused in public information from the awarding bodies. Unstructured or focussed in-depth interviews with individual students were considered to seek a more in depth response, or, to economise on time, a group interview or focus group. However, these processes would not in themselves engender a capacity to entertain alternative conceptions unless the researcher prompted the interviewees to do so. In order to create the opportunity for the participants to think outside their established conceptions and stimulate a degree of meta analysis of the nature of critical thinking it was decided to challenge students by introducing them to alternative views on the nature and applicability of critical thinking. In particular this would include the views of those critical of the ‘orthodoxy’ which regards critical thinking as a matter of generic analysis and evaluation skills applied to the use of evidence and reasoning. However, there would be significant problems arising from adopting a researcher role as ‘*agent provocateur*’, not least in overt bias affecting the outcomes and willingness of participants to offer opinions.

To retain researcher detachment from a particular position, an initial idea was to use quotes from ‘alternative’ writers such as McPeck and Bailin *et al.* to stimulate discussion. In order to do this in a way which also guaranteed that all individual views would be taken into account, the potential to utilise the technology of a computer based ‘classroom performance system’ was explored. This system, normally used as a pedagogical aid, enables individuals to vote simultaneously on information provided by choosing between

a range of option responses. Coded handsets allow each individual's responses to be registered, stored, recalled and identified. At the same time the software has the capacity to collate and display the distribution of voting preferences on each question/prompt. Once quotes were selected for inclusion it became apparent that by choosing only 'alternative' or challenging views, it would come across as a one-sided exercise which might create a defensive reaction and/or a conflict situation between the group and the researcher. In the interest of a more open and less threatening discussion, it was decided to include a more balanced mix of quotes concerning the core definition of critical thinking and the issue of its subject boundedness or independence. In their initial individual responses participants would simply be asked whether they 'strongly agree, agree, disagree or strongly disagree' with the statements provided. Although these prefixed categories created a forced choice which might be too crude to capture the nuances of participants' thinking, the purpose of this was to prompt reflection as the distribution of votes would be displayed to form the basis of group discussions. It is in these discussions that potential for an in depth exploration of the basis of these students' thinking about critical thinking was to be realised. The method adopted was far removed from the traditional image of interviewing as "'prospecting' for the true facts and feelings residing within the respondent" (Holstein and Gubrium 1997: 115). Instead it was seen as "a social encounter in which knowledge is constructed" (p.114) through the interaction of individual participants with each other, the researcher and the fragments of discourse concerning critical thinking introduced. This 'active interviewing' "eschews the image of the vessel waiting to be tapped in favour of the notion that the subject's interpretive capabilities must be activated, stimulated and cultivated" (p.122). Active interviewers do not "coax…respondents into preferred answers…Rather, they converse with respondents in such a way that alternate considerations are brought into play" (p.122-3). The selection and deployment of the method was designed to this end:

> *The objective is not to dictate interpretation, but to provide an environment conducive to the production of the range and complexity of meanings that address relevant issues, and not be confined to predetermined agendas* (Holstein and Gubrium 1997: 123)

Having conceived of this method as a unique hybrid of voting system combined with group discussion, perusal of Cohen ***et al.'s*** research manual (2007) led to realisation that the method bore a close resemblance to nominal group technique (Delbecq *et al.* 1975). This is a method used to facilitate group decision making. It is adopted by management groups to support strategy formation and, in the context of educational research, Cohen *et al.* associate it with the participatory and collaborative approach typically taken to establish an agreed focus in an action research programme (2007: 309-10). The first step of nominal group technique (NGT) involves provision of "a series of questions,

statements or issues" (Cohen *et al.* 2007: 309) to the group. It is described as a *nominal* group as each individual is asked to provide a silent personal response to the material provided by the facilitator, without any interruption by or discussion with others in the group. The ideas put forward by individuals are shared with the group, clarified and logged. Each participant votes on priorities from the list of options generated and the alternatives are ranked according to the aggregated average scores. Once the results of this vote are known, the ranking, with a breakdown of numbers voting, is displayed to the group. This then forms the basis of a group discussion phase.

It can be seen that the essential features of NGT were built into the case study. This involved use of prompt material supplied by the facilitator (researcher), data collection on an individual basis, a voting system, and group discussion of visually presented numerical outcomes. Although this variant did not confer the benefits of participants establishing the agenda through responses to initial open questions, in other regards the strengths of NGT were replicated as "all participants have a voice and are heard" (Cohen *et al.* 2007: 309). It gave each individual time to think and express a view and valued their contributions equally, provided a structured focus for gathering ideas, ensured the balance of views was visible to all, and reduced pressures to group conformity. It thus avoided some potential problems with group discussions, such as outcomes skewed by the views of a dominant minority, yet at the same time provided a basis *for* focussed group discussion. Use of a voting mechanism which tracks and displays individuals' responses publically may be considered an ethical issue as conditions of anonymity and confidentiality cannot be met as they would be in the Delphi technique's written alternative to NGT (Cohen *et al.* 2007: 310). However this issue was mitigated by three factors: the issues under discussion were not personally sensitive; participants had agreed to take part in research knowing that they would be involved in a group discussion; the exchange of views was in the context of an established group of peers for whom reflective discussion was part of the normal *modus operandi*.

A number of practical considerations had to be taken into account in the planning for and conduct of the NGT. These included the number and wording of the stimulus quotes from academic sources, as they would affect the interest and involvement of participants and the time taken to complete. The sample group in the case study (21 students) was larger than that recommended for NGT. Although some of the complications of size were mitigated by the use of the structured inputs and the familiarity of group members with each other, it was decided that the group would be split in two. As such the effective group size was still at the higher end of that recommended for NGT, and this was adjudged the maximum possible for effective management of participants' contributions.

4.3.4 Teacher response activity

The case study sample involved students following a discrete Critical Thinking course at A level: it was intended to generate comments on the nature and value of studying an explicit, dedicated course in critical thinking. The picture emerging was to be compared with the characterization of critical thinking provided by theorists Young and Furedi. In their accounts critical thinking is dismissed as formalistic, vacuous and of little value (section 2.3.4), and is deemed incompatible with and antithetical to a knowledge based curriculum. A further primary method conceived to throw light on the relationship between critical thinking and knowledge was borne out of the conjuncture of personal experience in teaching with and to materials used in Critical Thinking AS/A level assessments and familiarity with the debates concerning stand alone or embedded notions of critical thinking. In personal experience it had sometimes seemed that the critical evaluations of material expected for Critical Thinking had 'scratched the surface', relying on assessment of aspects of reasoning but lacking a sense of the import of material that relevant disciplinary knowledge would provide. A means of turning this into a researched phenomenon was conceived. A teacher response activity was devised which entailed issue of sample texts taken from Critical Thinking exam papers to experienced specialist teachers. These teachers were asked to indicate what they would expect a high ability student in their subject to comment upon in a critical response to the material. This was recorded in an open ended piece of writing and would later be compared to the kind of critical evaluation expected in a formal Critical Thinking marks scheme, in order to ascertain the degree of overlap and difference in the forms of critical evaluation expected and valued.

Given the need to enlist teacher cooperation in carrying out this response activity, a convenience sample from West College (the researcher's workplace) was selected. This facilitated ease of identification of suitable specialist staff and of arrangements for completion, collection and return of the responses. It was preferred to sampling staff at East College as knowledge of the research undertaken with Critical Thinking students there could have affected responses through 'second guessing' researcher expectations. Some difficulties were encountered in identifying suitable texts as awarding body materials are deliberately non-specialist to ensure accessibility for Critical Thinking students following a wide range of other courses. This limited the range of samples issued for comment, though it was possible to cover a spread of texts relevant across the fields of Science and Technology, Arts and Media, and Social Science n. The method was an adjunct to the main case study but had potential value in offering a different perspective on the central issue, particularly in giving a teacher perspective on subject based critical thinking skills which could be compared to the comments of students in the

case study. Whilst this is not claimed as triangulation in a positivist sense, helping to arrive at a fixed point of truth about the relationship between critical thinking and knowledge, it does represent a "creative analytic practice" (Richardson 2000: 929) which enhances and enriches the analysis through the "dialectic of learning" entailed (Olsen 2004: 4).

4.4 Ethical considerations and values

In the planning and situational decision making involved in the research, I adopted an ethical disposition, "a sense of rightness on which [to] construct a set of rational principles appropriate to …circumstances and based on personal, professional, and societal values" (Cohen *et al.* 2007: 75). Ethical choices are faced throughout the research process, from identification of research topic and purpose, to selection and application of procedures and methods, to analysis of data and report and dissemination of outcomes. The ethical dimension concerns the rights and wrongs of decisions taken, judged primarily in terms of their effects and implications for others. It is recognised that the researcher has responsibilities to participants in the study as well as to the wider academic community and the likely audience for the finished work. In addition there is responsibility *of* the self (as researcher) *for* the self (as a person). The researcher is therefore both moral *agent* and moral *patient*. The guiding principles followed in this research draw on both consequentialism and deontology: the former in the utilitarian principle that we should seek to maximise good and minimise harm (Christians 2008: 191-2); the latter in adherence to the Kantian principle that other people should be treated with dignity and respect, and in recognising a duty to take into account the guidelines in the ethical code for the conduct of research in education (BERA 2004). The principles of virtue ethics are acknowledged in seeking to conduct the research with honesty and integrity so that personal decisions taken throughout the process are in keeping with the common good as conceived by the research community: "the exercise of the virtues requires…a capacity to judge and to do the right thing in the right place at the right time in the right way" rather than basing the exercise of judgement on a "routinizable application of rules" (MacIntyre 2007: 150).

The area chosen for the research has evoked considerable debate and disagreement in the academic community (Chapter 3) but is not a sensitive issue in the public sphere. The research topic and focus were freely chosen by the researcher without involvement of sponsoring agents, there was therefore no interference of any external vested interests in the process and outcomes identified. The topic of critical thinking is, however, closely linked to the researcher's professional practice (section 1.1.2) including a role in teaching the subject in the sector chosen for the research and participating in relevant events for

professionals in this field. The research was prompted in part by critical reflection on the nature of the discourse and enterprise of critical thinking involved in A level Critical Thinking, creating a sense of being *in* but not entirely *of* that community of practitioners. While this engenders a sense of personal dislocation, it is not consequent upon undertaking the research, as the associated feelings were already present and indeed prompted interest in articulating and exploring the problematic more formally through academic research. On a personal level I have recognised and dealt with the possible accusation of being 'inauthentic' by continuing to teach a form of critical thinking that is explored critically through this research, on the grounds that i) I am committed to the value of existing practice to learners (whatever its limitations), and there is no threat to their preparation for the content and assessment of the course as I am able to maintain separation of teacher and researcher roles; ii) the outcomes of the research were not prejudged, but depended on an exploratory journey involving both academic sources and students' views.

The methodology adopted placed particular emphasis on critical engagement with relevant literature. While the absence of direct impact on people suggests few ethical implications in this, it was necessary to seek a balance between authorial respect and effective critique in responding to the literature reviewed. In an early draft the work of Moon (2008) was subjected to sustained critique without due acknowledgement of its contribution to the field and this was re-worked into what is intended as a more balanced response. In planning the primary research a range of ethical protocols were followed. Informed consent was obtained from an organisational representative and from individual participants in the case study and teacher response activity, with the right to withdraw at any point made clear in all cases. In the interest of transparency, information on the research (and researcher) was provided verbally to the organisational representatives and in writing in advance to the individual student and teacher participants, and written consent was obtained. The description and explanation of the research provided for participants was checked for its suitability and accessibility with the key institutional contact ahead of issue to students. No covert methods were used in the case study research which was based on questionnaire and group discussion formats. The case study participants were informed of the exact purpose and nature of the methods to be used, thus avoiding any deception. Stake notes that for any qualitative inquirer "entrapment is regularly on the horizon as the researcher, a dedicated non-interventionist, raises questions and options not previously considered by the respondent" (1985: 46). For Stake, this is a warning to those pursuing the goals of naturalistic inquiry to be aware of the inevitability of their impact on setting and shaping the agenda for the research through their interventions: the stance adopted here is to be open about this influence and to recognise that the outcome of the research is a social construct rather than a pure

reflection of respondent views. This was especially acute in the decision to proceed with the NGT activity which introduced new and potentially challenging ways of conceiving critical thinking to the participants. However, arguably this is liberating from an existing state of 'entrapment' as it opens up breadth and depth of thinking about the central concept which is otherwise precluded by the force of a dominant discourse which delimits the scope and meaning of critical thinking practice.

The teacher response activity was intended to elicit 'subject specialist thinking' about critical evaluation skills, which would then be compared against a critical thinking approach by the researcher. In this aspect of the study it was "not feasible for the researcher to be completely open and honest with participants" as "to be so …would contaminate the results" (Denscombe 2007: 144). In the interests of validity, to avoid respondents answering in anticipation of what a critical thinking approach might say, explanation of purpose was "handled by the researcher by presenting general information, not specific information about the study" (Creswell 2007: 142): it was couched in terms of expectations concerning higher level evaluation skills rather than making reference to critical thinking as such. This was especially important as this part of the study was conducted in my own workplace where it is known that I have a role in relation to critical thinking. A debriefing session was also arranged so that "participants are put in the picture about the true [*specific* in this case] nature of the enquiry" (Denscombe 2007: 144). In the conduct of the research privacy was protected throughout, with pseudonyms used and no participants (or participating organisations) identified by name in the collection of data and subsequent attribution of findings in the written report. Electronic records were stored on password protected computers to protect privacy and paper records were stored in a secure area of the researcher's home, not kept in a public location.

In anticipating potential ethical problems, one concern about possible harm to the student participants was the disruption to their studies caused by participation. This effect was minimised by restricting the research to a single visit and the key institutional contact was happy that there would be no significant harm to the students' progress on the course from the two hours taken out of their teaching time. Another concern was the possibility that the discussion prompted by the use of critical quotations might undermine the students' confidence and belief in the value of the form of critical thinking they were studying. This was explicitly discussed with the key contact, who agreed that use of a balance of stimulus quotes would mitigate this risk and indicated that students of critical thinking are used to critical reflection and that discussion of alternative views would be 'normal' for them.

It is recognised that the researcher has an obligation to act with integrity so that standards expected in the research community are met and it is not brought into disrepute or future activities jeopardised (Cohen *et al.* 2007: 75). This includes competence in the application of data collection and analysis techniques: "rigour in the design, conduct, analysis and reporting of the research" (Cohen *et al.* 2007: 62). Care was taken in selection and construction of research instruments and an honest attempt made to select and interpret findings to maximize accuracy and the faithfulness to respondent accounts (Cohen *et al.* 2007: 77; Denscombe 2002: 177). For instance in dealing with analysis of data from open ended methods (student questionnaire and teacher response activity), a systematic approach to generating analytic codings was taken, influenced by the approach used in grounded theory (Strauss and Corbin 1998, Charmaz 2003). Rigour also requires recognition of the scope of and limitations to the significance of research findings so that conclusions are not overdrawn and misrepresented. Conclusions were carefully framed to indicate their provisional and suggestive status. Cohen *et al.* point out the risks to future research access and activity if negative research reports are produced (2007: 75). In this research the likelihood of the report being viewed as negative was limited as it involved no direct judgement on the nature and performance of the institutions and individuals taking part. However, at its heart is critical consideration of the adequacy of conceptualisations of critical thinking as represented by the A level syllabus and allied assessment tools produced by the leading awarding body in this field. It was therefore recognised that any critical outcomes would need to be carefully represented and communicated.

There is a tendency in some discussions of research ethics to start from the premise that researchers are "professional scientists in pursuit of truth" (Cohen *et al.* 2007: 51) with a duty to report things "as faithfully and as honestly as possible, without allowing the investigations to be influenced by considerations other than what is the truth of the matter" (Denscombe 2002: 177). However the equation of the pursuit of truth with objectivity and value freedom is problematic. This rests on the foundationalist notion of an external truth waiting to be discovered, as associated with (post) positivist epistemology. Instead of seeking the exclusion of values from research (an unattainable goal according to Gouldner, 1962) it is acknowledged that they are intrinsic to the inquiry process, affecting

> *choice of the problem, choice of paradigm to guide the problem, choice of theoretical framework, choice of major data gathering and data analytic methods, choice of context, treatment of values already resident within the context, and choice of format for presenting findings* (Guba and Lincoln 2008: 264-5)

This corresponds to Bauman's view that "there is no choice between 'engaged' and 'neutral' sociology. A non-committal sociology is an impossibility" (Bauman 2008: 517). In this way *value relevance* is acknowledged but I have retained a commitment to *value freedom* as a regulatory principle in the conduct of the research, following Weber's distinction (Christians 2008: 189). I have adopted a pragmatic approach which

> *recognises that there are inherent limits to how far objectivity can be achieved, but still treats it as an ideal to which the researcher should aspire in terms of a reasonable level of detachment and a reasonable level of open-mindedness.* (Denscombe 2002: 158)

Hence, I have indicated aspects of self identity and social values that have affected the formulation of the research, the choice of literature sources and the interpretations offered. I have sought to avoid deliberate distortion of findings by ensuring transparency and avoiding deception. I have considered a range of alternative positions on the conceptual, epistemological, methodological and theoretical matters explored and sought to refer in an open-minded way to the outcomes from primary research.

Guba and Lincoln suggest that differences in approach to ethics and values are one of the distinguishing features between 'old' (positivist) and 'new' (interpretivist) paradigms. They claim that

> *Objectivity derives from the Enlightenment prescription for knowledge of the physical world, which is postulated to be separate to and distinct from those who would know. But if knowledge of the…world resides in meaning-making mechanisms of the social, mental, and linguistic worlds that individuals inhabit, then knowledge cannot be separated from the knower, but rather is rooted in his or her mental or linguistic designations of that world* (Guba and Lincoln 2008: 268)

In setting out their own constructivist position in this way, Guba and Lincoln appear to replace the notion of external truth with an alternative, equally essentialist, subjectivist view of truth as something which resides in the individual psyche. It is on this point that the distinction was made (section 4.2.2) between *constructivist* and social *constructionist* approaches. The position taken here is that meanings are publically available social constructs rather than relative to each individual, private and ultimately unknowable. Rather than abandon pursuit of truth, the constructionist endeavour is to reveal more of the socially and situationally defined nature of what passes for truth.

Chapter 5: Policy espoused, enacted and experienced in A level Critical Thinking

5.1 Introduction

This chapter considers A level Critical Thinking as a focus for conceptual and policy analysis and the application of curriculum theory, and for an investigation of participant perspectives. The chapter begins with an empirical account of the introduction of A level Critical Thinking which is informed by public information available from the relevant awarding bodies (OCR, AQA), policy and curriculum authorities (BIS, QCA), and by the work of the Cambridge Assessment Group, which is the research arm of the OCR awarding body that first obtained approval for the qualification. Explicit links are made with different concepts of critical thinking described in Chapter 3 and with the curriculum theories of Young and Kelly. The chapter then sets out the findings of primary research in order to illuminate issues and problems identified in the theoretical and conceptual analysis. It gives voice to some of those who have experience of critical thinking in PCET and complements the overview of expert analyses. The views of students in an exemplar centre for A level Critical Thinking provide illustration of how it is experienced and perceived. In considering these accounts attention is paid to the underlying conception of critical thinking held and how this equates to competing definitions and descriptions (section 3.3). Issues of pedagogical as well as theoretical significance arise out of the analysis. The accounts also raise questions about the validity of generalised statements about the value and efficacy of critical thinking in the work of Young and Furedi (section 2.3.4). Particular attention is given to the debate about the possibility and desirability of teaching critical thinking on a standalone or field specific basis. The teacher response activity supplements student perspectives in this regard and in relation to the links between critical thinking and subject knowledge.

5.2 Critical thinking in the GCE A level curriculum

Critical Thinking was first introduced as an A level subject with the 'Curriculum 2000' reforms that led to the creation of AS levels as accredited half A levels. AS Critical Thinking was conceived as a complementary skills based subject that would enhance students' learning on their other A level courses. The timing of its introduction coincided with the National Curriculum changes of 2000 that stipulated thinking skills as part of the cross curricula entitlement of all school students. The case for thinking skills had been made in the government commissioned McGuiness Report (1999). Coinciding with the establishment of Critical Thinking as an AS level subject, the LSDA commissioned

research in 2002-3 to provide “an evaluation of thinking skill taxonomies for post 16 learners” (Moseley *et al.* 2004). The report notes that “very little research into thinking skills in post-16 learners has been carried out in the UK” (2004: section 6.4). The abstract for the report states that

> *The project was undertaken because thinking skills are not explicitly built into education and training for post 16 learners in England…The main interest was in how an understanding of how people think and learn at the age of 16 or above can inform instructional design, course and lesson planning, teaching, learning and assessment.*

This report was too early to include assessment of the new AS level but its general policy recommendations informed changes to the National Curriculum in 2008: “Consideration should be given to developing new programmes focussed on the study of human thinking, learning and behaviour” which, following Lipman (2003), should include “critical, creative and caring thinking” (Moseley *et al.* 2004: section 6.5). This found expression in the Personal Learning and Thinking Skills (PLTS) component of the new 14-19 Diploma qualifications. The case for critical thinking has been furthered by its fit with policies that emphasise the need to equip future workers with flexible skills that meet the needs of a shifting labour market (Leitch 2006, BIS 2009, 2010). This “encourages skills that are transferable from job to job” (BIS 2009b: p.6 para13). The policy emphasis on employability and transferability has had most direct impact on vocational programmes in PCET but meanwhile a high proportion learners continue to follow A level programmes in a subject led curriculum and this is the context in which most students take an AS/A level in Critical Thinking.

5.2.1 The introduction of A level Critical Thinking

According to Black the introduction of AS level Critical Thinking “has been the catalyst for the largest scale introduction of critical thinking into schools in England” (2009a: 3) with just over 2000 candidates in its first year in 2001 and over 22,000 by 2009. Black’s figures include those who enter for the qualification as part of a college course (27% of AS Critical Thinking entrants in 2009). About one third of A level centres now offer the course and it was the fastest growing AS level at the time of Black’s research (2008: 3). Numbers sitting the exam exceed those taking AS level French and are about one fifth of entries for the single biggest subject (AS English). In the summer examinations in 2010 there were 18,871 entries for AS Critical Thinking, representing 1.6% of all AS entries, and 2082 A level Critical Thinking entries, representing 0.2% of total A level entries (BBC 2010). The OCR examinations board was the sole awarding body for Critical Thinking until a new AQA syllabus was approved and introduced in 2009. In June 2010 the latter

accounted for 1,736 entries at AS and 126 at A level in Critical Thinking (BBC 2010). The AS is one of three options for broader study (others being Citizenship or General Studies) included as part of the AQA Bacc. alongside a 3 A level programme, approved Enrichment learning and an extended project.

Critical Thinking is a mandatory subject for students in 1 in 7 of institutions offering it (Black 2009a: 11). For the remainder it is most commonly an optional subject that can be taken in addition to a student's main programme of typically 3 or 4 AS levels. In just under half of cases, admission to the course is based on the standard entry requirements of the school/college, but in a further 44.5% of cases there is some selectivity. And even when this is not the case formally, there is often encouragement of more able students to do the course (Black 2009a: 12-13). The courses are taught in significantly less time on average than a typical AS subject, with mean teaching hours of 57 for Critical Thinking compared to approximately 150 generally. This together with the fact that there are "a number of teachers who have only superficial acquaintance with the discipline and thus have a limited idea of what it entails" means, according to Black, that "it is not surprising …that universities have different policies on the value of Critical Thinking for admissions" (2008: 3). These policies range from full acceptance for UCAS points in offering places on an equivalent basis to other subjects (e.g. University of Essex) to acceptance by some departments (e.g. University of Kent) to non-acceptance (e.g. University of Nottingham). In a number of cases feedback from admissions staff indicates that study of and success in Critical Thinking is a valuable indicator as supplementary evidence outside a student's main offer. This ambivalence on the value of Critical Thinking is found despite the apparent difficulty of the subject as indicated by the chances of achieving high grades. In 2010 34.8% of Critical Thinking candidates achieved A level grades B- A* compared to an average of 52.2% across subjects, including 3.6% achieving the new A* grade in Critical Thinking compared to 8.1% overall (BBC 2010). Whether Black's is the correct interpretation of variable admissions policy, or whether other factors such as ignorance of the demands of the course or inability to accept the value of anything other than 'traditional subjects' play a part, there is considerable irony in a situation where some universities do not accept direct evidence of skills in critical thinking for admission to programmes of study when these are the very skills said to be characteristic of this level of learning (Barnett 1997, Moon 2008 *inter alios*). This irony is encapsulated in the situation whereby LNAT and BMAT assessments are used by institutions with especially high competition for places on Law and Medicine courses and these admissions tests include critical thinking components which are at root derived from the same concept of critical thinking that has informed development of the AS/A level (see below), as are the questions in the Thinking Skills Assessment used by Oxford University for selection of

candidates onto PPE, Psychology and other courses (taken by over 3,000 candidates in 2009-10).

5.2.2 Underpinning conception of critical thinking

The Cambridge Assessment group has been influential in delineating conceptions of critical thinking that have gained ratification by the Qualifications and Curriculum Authority. Its work exemplifies 'policy enacted' as it has defined the terms and scope of the concept of critical thinking as it has entered the discourse and practice of PCET. The OCR AS level Critical Thinking examination papers are now in their third format since the inception of the course in 2001 and the A2 in their second incarnation since 2006. These are the most high profile and commonly taken qualifications in the suite of products developed by the Cambridge Assessment group over the last twenty years since the creation of the MENO thinking skills tests (Black 2008: 4). With the growth and evolution of these assessments, Cambridge Assessment recently decided that "an explicit working conception of the domain of Critical Thinking" was needed to replace that which had built up "implicitly through the coincidence of common personnel involved in the development and item writing" (Black 2008: 1). This would be used as a reference point to gauge the relevance and appropriateness of specific items included in syllabus and assessment content in the subject. Although the primary starting point was a desire to provide a means for checking the validity of assessment instruments used by the awarding body and which could be used to guide development work on new specifications, it also sought a definition "adequate in the sense that it is well underpinned by experts' conceptions of Critical Thinking in the literature" (Black 2008: 2). Thus the process undertaken involved a measure of external validation as well as providing a means of checking the internal validity of materials produced. There is an attempt to set out the core content of the subject of Critical Thinking which "in years to come…may need to be reviewed in the light of the natural evolution and development of the discipline" (Black 2008: 3). This explicit articulation of the definition and delineation of the scope and meaning of the concept provides a window into the social construction of critical thinking as an academic discipline. Black notes that "perceptions of Critical Thinking are highly varied…with philosophical definitions at odds with psychological ones, some focussing on skills whilst others emphasize dispositions, and so on" (2008: 3). A panel of four experts with "an aggregate of 57 years of experience in Critical Thinking and six published books" (2008: 5) were tasked with deriving a definition and taxonomy of critical thinking and with mapping qualifications against these. The work of Facione (1990) and the LSRC (Moseley *et al.* 2004) provided key reference material as both sources sought consensual definitions based on overviews of the many existing taxonomies.

The experts adopted what Black describes as an 'iterative process' with theoretical constructs refined and adapted in the light of existing practice in the curriculum and assessment of critical thinking. In this way a degree of independence in reference to theory was evident together with realism in the acknowledgement of existing working practices of those doing Critical Thinking. Black suggests this avoids "an overly self-confirmatory definition and taxonomy" (2008: 6); however, the experts had themselves been involved in the introduction of various critical thinking 'products' and their particular vision of critical thinking is likely to have been evident in both the selection of conceptual characteristics from theory and in recommendations for practice. It is thus inevitably self confirmatory, whether 'overly' or not, as the work is carried out by a community of specialists with shared interests and experience working within a particular paradigm.

The definition of critical thinking arrived at by the Cambridge Assessment panel is given as follows:

> *Critical Thinking is the analytical thinking which underlies all rational discourse and enquiry. It is characterised by a meticulous and rigorous approach.*
>
> *As an academic discipline, it is unique in that it explicitly focuses on the processes involved in being rational.*
>
> *These processes include:*
>
> - *Analysing arguments*
> - *Judging the relevance and significance of information*
> - *Evaluating claims, inferences, arguments and explanations*
> - *Constructing clear and coherent arguments*
>
> *Forming well reasoned judgements and decisions*
>
> *Being rational also requires an open-minded yet critical approach to one's own thinking as well as that of others.* (Black 2008: 7)

It is a definition which emerges from a paradigm which can be traced back to Dewey and the critical thinking or informal logic movement (referred to interchangeably by van den Brink Budgen, 2007) as described in sections 3.3.1-4: dispositions are prominent in Ennis's work (1987) and in Paul and Elder (2002); argument analysis in Scriven (1976) and A. Fisher (2001, 2004). A simple indicator of this consensual paradigm is the list of references cited by Black, comprising the authors mentioned together with Glaser and Sternberg. In the OCR specification's recommended teachers' reading list the same references are listed along with Bowell and Kemp (2005) and Thomson (2002) and a range of course books aimed at the qualifications. These authors all subscribe to a

fallibilist or positivist epistemology. The formation of the expert group at the Cambridge summit meeting and their relationship to the broader field of expertise indicated represents an active attempt to call upon a "social network of expert practice" (Moore and Young 2010: 32) to provide warrant for the knowledge content of the critical thinking courses. This appears well matched to

> *the social realist approach that... recognizes the social character of knowledge as intrinsic to its epistemological status because the logical reconstruction of truth is always a dialogue with others set within particular collective codes and values.* (Moore and Young 2010: 32-3)

However, a difficulty in applying this to this situation is immediately apparent when it is recognized that there is no place for dissenting voices such as McPeck (1981), Barnett (1997), Bailin *et al.* (1999) or even for the influential Lipman (2003) in the collective settlement of core principles for the A level syllabus in critical thinking. This illustrates the problem of presumed consensus in the realist view of expert communities.

5.2.3 Epistemological assumptions and comparison with Dewey

Despite the close match to the informal logic paradigm, there are two features of the Cambridge Assessment definition which appear to be at odds with Dewey's work. Firstly the description of analysis as an ability "to dissect arguments and information" (Black 2008: 7) sounds very similar to the idea of analysis as "picking to pieces" which is rejected by Dewey along with the view of synthesis as "piecing together" (2007: 56). Dewey stresses the sterility of descriptive processes of dissection and reconstruction in the pursuit of classification schemes

> *intellectual analysis is often treated…as if it were the breaking up of a whole into its constituent parts…this conception leads to the further notion that logical analysis is a mere enumeration and listing of all conceivable qualities and relations*. (2007: 55)

The emphasis in the Cambridge Assessment panel's definition on a "meticulous and rigorous approach" is in keeping with Dewey's advocacy of "the formation of careful, alert and thorough habits of thinking" in which "caution, carefulness, thoroughness, exactness, orderliness, methodic arrangement…mark off the logical from what is random and casual" (2007: 29). However this description is denuded of Dewey's emphasis on *judgement* as the driver for the purposeful and concurrent realisation of analysis and synthesis, as when using analytical judgement to clarify the precise nature of a problem, to establish relevant considerations, to distinguish important factors from unimportant, and at the same time using synthesis in seeing the "bearing of facts on a conclusion or of principle

on facts" (2007: 56). For Dewey combining the *parts* of an object of study through synthesis, presupposes some understanding of the *whole* as the salient parts cannot even be identified without this: "Connection, relationship with a larger whole is already involved" (2007: 57). At the same time any grasp of the whole which informs analytics will entail selective interpretation "emphasis on the features that are significant"… "hence the folly of trying to set analysis and synthesis over against each other" (Dewey 2007: 57). Although synthesis is not considered in the Cambridge Assessment definition or other equivalent definitions from the critical thinking movement, it may be considered to be implied in the process of argument analysis advocated and implemented in Critical Thinking examinations (OCR, AQA). These involve identification of component parts of an argument that both require and contribute to an understanding of the whole. However, this two dimensional depiction of textual logic misses the full import of Dewey's reference to 'the whole' which could be construed as adding a third dimension comprised of the interpretive framework which contextualises the sense of the text. In other words argument (and knowledge) are imbued with theory. In Dewey, there is a nascent social constructionism (section 3.2.3) which is missing in a critical thinking movement with a rationalist preoccupation with 'logical relations' (Walters 1994: Introduction, Chapter 4).

The second feature of the definition which appears to run counter to Dewey is the express exclusion of problem solving as a core component

> *Problem solving, while it uses many reasoning skills and processes which are a facsimile of those in the Critical Thinking taxonomy, is different in that the solutions to a problem replaces the argument…The techniques for arriving at a correct solution in Problem Solving are in many cases different to Critical Thinking – e.g. trial and error, and insight are much more important in Problem Solving.* (Black 2008: 11)

For Dewey the starting point for reflective thinking is a problem encountered in our physical or mental experience and the whole point of the reflective endeavour is to solve or resolve this: "habits of active inquiry and careful deliberation in the significant and vital problems of conduct afford the best guarantee that the general structure of mind will be reasonable" (2007: 29). Currently there is inconsistency in the relationship between problem solving and critical thinking as in 2009 the OCR board's publicity stated, contrary to the recently formulated expert view, that "A Level Critical Thinking helps learners develop skills of analysis and evaluation, communication and problem solving". Furthermore problem solving is the focus of the second half of the key text by Butterworth and Thwaites (2005) which still appears on OCR's recommended reading.

To equate critical thinking with rationality (*cf*. Siegel 1988: 32) seems a natural extension of Dewey's assertion that "the whole object of intellectual education is formation of logical

disposition" and "the intellectual end of education is entirely and only the logical – through habits of thinking" (2007: 30). However the Cambridge Assessment definition includes the further claim that critical thinking as a discipline is *unique* in its focus on the processes involved in being rational. This presupposes that critical thinking can justifiably be described as a 'discipline' and makes a contentious claim with regard to its monopoly over analysis of reasoning, when this has been a main thread running through the history of its parent discipline, Western philosophy, and is also a major focus of cognitive psychology (Johnston *et al.* 2011: Ch 3). Black's explication of this in terms of the ubiquity of reasoning as fundamental to rational discourse in both academic and everyday contexts assumes acceptance of the generic applicability of reasoning skills. This is axiomatic in the paradigm of a critical thinking movement which precludes the alternative view that reasoning can only be understood and assessed in particular epistemological contexts (section 3.3.5). It is fundamental to the creation and justification of critical thinking as a standalone subject which can be accessed by students regardless of their areas of specialism on other courses: "The value of the discipline is that it can be applied in all contexts in which reasoning occurs or should occur" (Black 2008: 8). It provides a rationalisation for the use of everyday texts as source material for Critical Thinking assessments, devoid of any suppositions regarding prior knowledge.

In the Cambridge definition, Critical Thinking is said to describe 'processes involved in being rational'. These processes are summarised in one way in the four bullet points in the definition, and in another as the five overarching categories derived from Facione (1990) which structure the detailed taxonomy provided, *viz.* analysis, evaluation, inference, synthesis/construction, self reflection and self correction (Black 2008: 9-10). However, these categories are headed as 'skills/processes' and divided into more detailed 'sub-skills/processes', suggesting either conflation or indeterminacy in the use of the terms 'skill' and 'process'. The two levels of generality approximate the distinction made by Ennis between abilities and skills (1987: 13-15). Bailin *et al.* have noted that "much of the literature contains a pervasive miasma of overlapping uses of such terms as skill, process, procedure, behaviour, mental operations" (1999a: 269) and this is reflected in the Cambridge group's overview. Bailin *et al.* argue that skills and processes have been confused with accomplishments in this approach (1999a).

From the mapping exercise undertaken it was concluded "that all Critical Thinking products were either substantially or entirely within the definition and taxonomy" (Black 2008: 11). The syllabus of OCR's A/AS Critical Thinking confirms this, with a main focus on reasoning and use of evidence in argument and an AS examination paper with sections comprising 'The language of reasoning' and 'Credibility' (Unit 1); 'Analysing and evaluating argument' and 'Developing your own arguments' (Unit 2) while the synoptic A2 Unit 4 paper includes sections 'Analyse', 'Evaluate', 'Develop your own reasoning.' The

other A2 paper on 'Ethical reasoning and decision making' (Unit 3) is less obviously related to the Cambridge taxonomy, which makes no specific mention of ethical reasoning other than a note in relation to 'Inference' that "principles may be ethical principles". In the context of the examinations it is clear that understanding of ethical principles and their application, and knowledge of their derivation from ethical theories, is advantageous (OCR mark schemes for Unit 3). Indeed 'decision making' on the OCR paper appears to be assessed specifically in the context of a rational application of ethical principles to an issue presented. There is no scope for use of other decision making schemes such as cost-benefit analysis, risk assessment or mathematical modeling. This suggests that part of the assessment tool (ethical reasoning) cannot be derived from the taxonomy and part of it (decision making) is inadequately conceptualized and described in the taxonomy. This may reflect "intervention from external agencies" (Black 2008: 11) such as the QCA and if so this has consistently been the case as ethical reasoning has been included since the introduction of the A2 Critical Thinking in 2006. It should be noted that the newly introduced AQA syllabus for AS/A level does require attention to risk analysis, probability and decision making theory (specification pp.37-9). It also moves away from an undifferentiated notion of rationality by including recognition of the importance of different areas of discourse (scientific, aesthetic and ethical) in determining acceptable forms of evidence and reasoning when assessing the justification of claims (AQA specification para 3.1.2). Nonetheless it shares with the OCR counterpart the view that "Critical Thinking is predominantly a practical, skills based discipline. No specialist knowledge of any particular academic subjects is required" (AQA specification p.1). This concurs with the view that reasoning skills are independent of fields of study and therefore remains wedded to the informal logic movement paradigm.

5.2.4 The benefits of critical thinking?

In public information provided by OCR and AQA, emphasis is placed on the benefits that can accrue from studying Critical Thinking:

- *It provides learners with skills such as analysis, evaluation and the ability to compose reasoned and coherent arguments which can benefit their performance across a range of subjects both in the humanities and sciences*.

- *It provides opportunities for learners to think deeply, and in a structured way, about issues that are key to participating in society, e.g. ethical questions, cultural issues and issues of personal responsibility.*

- *A Level Critical Thinking drives higher-order thinking skills and is valued by universities as well as employers. It offers excellent preparation for study at Higher Education level but also prepares learners for the tests they will be asked to complete while looking for employment.* (OCR 2008: 3)

The claim made in the first of these points has been used in public information (OCR News 2008) which cites in support research undertaken by Black on the performance of Critical Thinking students in their other A level courses (2009b). Black's research is based on a study of the A level performance in 2006 of all candidates who sat AS Critical Thinking in 2005 compared to non-Critical Thinking students with a similar GCSE performance profile.

Table 5.1 Comparison of A level results of Critical Thinking and non-Critical Thinking students

	Mean A level Score	
Subject	**Non-Critical Thinking Students**	**A/B grade Critical Thinking Students**
Biology	8.76	9.17
Chemistry	8.96	9.35
Physics	8.94	9.33
Maths	9.02	9.32
Geography	8.64	9.17
Economics	8.98	9.46
Psychology	8.01	8.55
English	8.91	9.24

To calculate mean A level score A=10, B=8, C=6, D=4, E=2, U=0.
Source: Black 2009b: 4

The high achievers in Critical Thinking (A or B grades) obtained significantly higher mean A level grades across all subjects (except History and Further Maths) with a difference of between 0.3 and 0.5 points per subject (Table 5.1). As this is based on an allocation of points to grades value on the basis of intervals of 2, it suggests an overall improvement in achievement of a minimum of half a grade for a three A level candidate (3 x 0.3) to a maximum of a full grade for a four A level candidate (4 x 0.5) depending on subject combinations. Black reports that analysis of the performance of other students taking AS Critical Thinking showed that all apart from those obtaining U grades had higher mean A level scores. Black concludes that "this backs up the hypothesis that CT skills are transferable and applicable to a wide range of subjects" (2009b: 3). However, this assumes that 'applicable' skills are also valued ones that contribute to improved performance, begging the question of if/how these skills are incorporated into the assessment of different subjects. Also the notion of transfer is itself problematic (Johnston *et al.* 2011), though in considering transfer between fields in an HE context, Johnston is concerned with implicit skills rather than the effect of an explicit critical thinking intervention such as AS level.

It could be questioned whether successful study of Critical Thinking is a causal variable in the correlation with general A level performance, particularly as there may be motivational and/or social background differences in the CT and non CT cohorts; if there

is a greater predisposition to deep learning (Entwistle and Ramsden 1983) amongst those choosing Critical Thinking this might also account for higher levels of general achievement, and may itself be related to cultural differences linked to social class or ethnicity. Black acknowledges the limitations to the findings: "Because the 'doing CT' was not a randomly assigned intervention, we cannot know for sure whether this *caused* the improvement in A level grades…." (Personal communication 5.2.10). However, she goes on to suggest that "nevertheless, the analysis seems to indicate that, whether causal or not, doing CT (and CT grade) does contribute to the explained variance of mean A level score". Despite its author's caution, the outcomes of this research were used in a 'news bulletin' published on the OCR website on 5th December 2008 under the headline "Dramatic Improvement with Critical Thinking". The credibility of both the findings and this use of them is undermined by the vested interests of a commercially driven organization.

5.2.5 A social realist analysis of A level Critical Thinking

In its skills based curriculum manifestations, critical thinking appears to epitomise the trends to evacuation of content described by Young. Whilst there has been some debate as to whether critical thinking can be defined *solely* in terms of a set of skills (Paul and Elder 2002) or can appropriately be described in these terms (Bailin *et al.* 1999a), most definitions make reference to a core of skills which provide the foundation on which other factors are built and this is reflected in the Cambridge Assessment Group definition and taxonomy. As an A level it is set apart from other subjects as a focus for learning and assessment in its own right thus reinforcing the idea that it can be carried out meaningfully independently of fields of knowledge. Most teachers are non-specialists and there has been an assumption that teachers from any discipline can pick up the skills and support students' development of them (Black 2009a).

Young is critical of the contribution of critical thinking to the trend to genericism he associates with evacuation of knowledge (section 2.3). A level Critical Thinking is genericist insofar as it teaches and assesses general skills of argument and reasoning which are not dependent on any subject specialist knowledge (unless it is construed as a specialist knowledge area in itself) and which are deemed transferable and valuable to other domains of study. However, it is a discrete option choice within an A level programme rather than a compulsory component of all courses as in a vocational programme like the PLTS or key/functional skills in 14-19 Diplomas or new Apprenticeships. It would therefore appear to conform only partially to the notion of thinking skills which is criticized by realists for its association with genericism.

In associating critical thinking with soft genericism, Young and Furedi make judgements about its value - it is derided as formulaic and vapid - based on assumptions about its pedagogical form. Young describes the skills as "unassessable and conceptually flawed" (2009a: 2). These descriptions may have some validity when applied to PLTS on vocational programmes. Although these are contextualized in Principal Learning and in this sense 'field' based, they rely on vague descriptors, are devoid of stipulated knowledge content, lack a clear structure of development and use a simple checklist approach to assessment (QCA 2007, Diploma Support Organisation). However, the A level form of critical thinking does not conform to these descriptors as it is underpinned by detailed and specific syllabus content and assessment criteria (OCR, AQA). The depiction of the amorphous character of soft thinking skills is not an inevitable quality of critical thinking *per se.* Rather it may be found in certain forms that could be said to provide evidence of 'evacuation of skills' to parallel the evacuation of knowledge Young describes; while in others, such as the A level, opposing qualities of rigour and precision are evident. It should also be noted that Young and Furedi appear to conflate curriculum content and pedagogical practice in assuming that a course based on generic reasoning skills will inevitably be decontextualized and as such be experienced as abstract and foster disengagement. This recreates the conflation Young criticizes on the part of those who advocate an experiential approach to education not only as a pedagogic strategy, but also as a basis of curriculum content (2010b: 24).

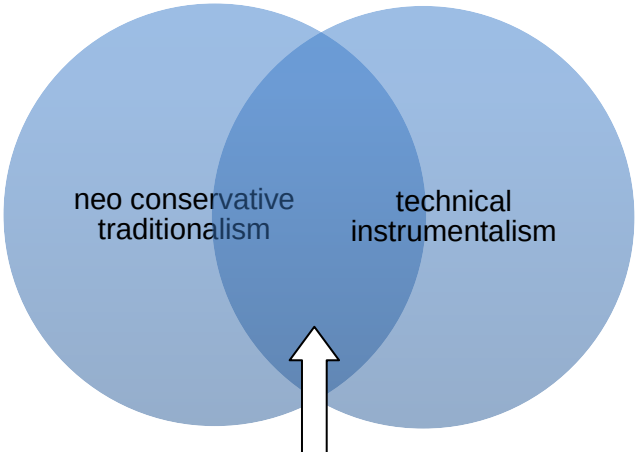
In the rationale for study presented in public information critical thinking is promoted in terms of its capacity to enhance performance on other courses and to provide skills relevant to employment and higher education (OCR 2008, 2010). The skills involved are regarded as transferable and their value is portrayed in instrumentalist terms: "from this perspective education, the curriculum and even knowledge itself become a means to an end, not ends in themselves" (Young 2008: 21). .Citing Beck, Young suggests that "technical-instrumentalism also imposes on educational institutions a style of managerial regulation that is integrated with the broader apparatus of performance indicators, target setting and league tables" (2008: 21) and the public information about Critical Thinking A level appears to embrace this ideology. The claims made for transfer of critical thinking are conveyed without qualification, though it has been shown that both transfer between fields (across subjects) and between domains (e.g. further to higher education) can be impeded by a range of psychological, cultural and institutional factors (Johnston *et al.* 2011). Furedi (2004) claims it is folly to assume that completion of a critical thinking course will necessarily translate into personal dispositions of criticality in our interactions with the world.

Young specifically associates critical thinking with technical instrumentalism and not with the other dominant educational ideology of neo-conservative traditionalism. This view of the curriculum is characterised by a preference for traditional academic subjects, with the knowledge content enshrined in and transmitted through the exam board syllabi. As awarding bodies stress the distinctiveness of Critical Thinking as a skills rather than content based AS/A level (OCR 2009), it would seem that critical thinking has little significance for the neo conservative ideology, except as an example of the counterpointed process based curriculum (following Kelly's terminology), which is exactly how Furedi (2009) portrays it. Proponents of the neo conservative perspective such as current Education Minister Michael Gove (Young 2009a) and Chris Woodhead (ex Chief Inspector of Ofsted) are dismissive of critical thinking as knowledge *how* and hold a particular conception of knowledge *that* as worthwhile. However, it is suggested here that critical thinking is actually closely bound up with the operations and aspirations of neo conservative traditionalism.

With the introduction of Critical Thinking as an AS/A level there has, of necessity, been a process of establishing its credentials as a *bona fide* subject, beginning with the need to satisfy QCA requirements (van den Brink Budgen 2007). While it is portrayed as a skills based subject, these skills nonetheless have to be systematised in an overview of syllabus content. The recent Cambridge Assessment Group 'summit meeting' of experts to arrive at a consensus on the definition and taxonomy of critical thinking (Black 2008) can be seen as an exercise in validating course content and in enhancing credibility. It effectively sets the agenda for what the subject comprises: the territory has been mapped and defined by what is enshrined in the syllabus. A particular way of conceiving of critical thinking has become increasingly institutionalised as an industry of textbooks, teacher networks and conferences has built up around the subject, thereby confirming and reinforcing its veracity. A level Critical Thinking is *en route* to becoming a constituent part of the externally validated, externally *given* curriculum and as such takes its place in the content based curriculum described by Kelly as resting on an 'absolutist epistemology' (2004: 47).

Young suggests that neo-conservatism is not so much concerned with the status of traditional subjects and qualifications as it is with "the view that the traditional discipline of learning promotes proper respect for authority and protects traditional values" (2008: 20). What is studied is secondary to the level of rigour and the standards of excellence associated with the traditional generalist A level programmes. There is an expectation that assessment within this framework will differentiate learners effectively, with a premium placed on high grades for University entrance. It was noted that it has been claimed that study of Critical Thinking at A level enhances chances of achieving high

grades across A level subjects (Black 2009b). Teachers associate it with higher performance and schools/colleges frequently offer it as a subject to higher ability students to support their chances of maximising their grades (Black 2009a). Universities also place value on critical thinking skills in seeking to select the best candidates for highly competitive places, as evidenced in the use of assessment tools such as the Oxford Thinking Skills Assessment and the national admissions tests for Law and Medicine (LNAT & BMAT). This association of critical thinking with pursuit and maintenance of high academic standards mirrors that made in higher education itself (Moon 2008). As such it links it to the values and aspirations of neo-conservative ideology. The focus on performance gains ties it in with the central concerns of both a neo-conservative ideology and the technical-instrumentalist ideology (Figure 5). This suggests that these ideologies are not mutually exclusive and the shared ground between them helps explain a concurrent existence despite what Young refers to as "the tension between the two models" (2008: 21).



Emphasis on high achievement; maintaining standards; critical thinking as means to an end

Figure 5 Confluence of neo conservative traditionalist and technical instrumental ideologies

In portraying critical thinking as a form of soft genericism, Young overlooks the potential significance it has for the traditional curriculum in its AS/A level guise. Furthermore it is possible that unexplicated forms of critical thinking contribute to performance at higher levels within A level subjects across the curriculum. Moseley *et al.* "asked 37 FE teachers to rate the importance of 69 different thinking skills…and established that the higher level categories correspond quite closely with how practitioners already think about thinking skills" (2004: section 1.7). If the acknowledged thinking skills are modelled, encouraged and developed in these teachers' work with learners, however implicitly, this lends support to the notion of a hidden critical thinking effect. Marks bands for higher grade performance in A levels typically emphasize skills in analysis, synthesis

and evaluation (the higher level of Bloom's taxonomy). For example AQA Biology A level includes the following assessment criteria:

> *assess the validity, reliability and credibility of scientific information…analyse, interpret, explain and evaluate the methodology, results and impact of their own and others' experimental and investigative activities* (AQA 2010)

Similarly AQA Economics A level requires candidates to demonstrate that they can "Analyse economic problems and issues… Evaluate economic arguments and evidence, making informed judgements" (AQA 2010). An issue for exploration here concerns the extent to which the higher level skills required are defined on a subject specific basis or on a generic basis that includes the informal reasoning skills identified and emphasised in A level Critical Thinking. Some initial insights into this issue are provided by the evidence from the student and teacher samples in the primary research.

From a more developed analysis of the curriculum role of critical thinking using Young's framework, it can be seen that it links to and supports neo-conservative ideology as well as technical-instrumentalism. It has been argued that Young has created a false dichotomy in setting up these contrasting ideologies. Once it is recognised that they are not mutually exclusive, it can be seen that critical thinking is compatible with both approaches. The overlap of policy and assessment focus on standards of excellence has been suggested as a source of commonality between the ideologies. It is further suggested that these ideologies share common epistemological ground. As Young himself notes (2008: 18), in each case what counts as knowledge is taken for granted as an external given, whether this be the *propositional* knowledge prioritised under neo-conservatism or the *procedural* knowledge encouraged by technical-instrumentalism. Whilst the neo-conservative approach has a rationalist heritage, echoing Plato's ideal forms and Hirst and Peters' "modes of experience and knowledge" (1970: 63), the technical-instrumental ideology has affinity with empiricist approaches to knowledge. In each case knowledge is developed in pursuit of truth, and critical thinking has a key role to play in clearing the path towards truth, purifying reason through the elimination of flaws and establishing fact through the critique and validation of evidence. It is therefore apparent that critical thinking is both desirable and necessary to the pursuit of these ideological positions. Given Young's rejection of both these ideologies and that critical thinking is *implicated* in their enactment, it can be seen that the outcome of applying a more extensive analysis of forms of critical thinking is still its rejection from a Youngian perspective. What remains to be considered is whether critical thinking, in any form, might play a part in Young's alternative social realist conception of the curriculum. This is

returned to in the Discussion Chapter, following report of findings from the primary research into A level Critical Thinking.

5.3 Primary research analysis and interpretation

The research sample and methods are explained in Chapter 4. The findings from student and teacher contributions are presented in turn, with further insights provided in a section which draws out points of comparison between them and in relation to the theoretical context. Specific evaluative observations are raised at appropriate points throughout the commentary and more general reflections on methodology are included in the concluding chapter.

5.3.1 East College case study: questionnaire method and analysis

This was the first method used with the sample cohort, once the research background, process and roles had been explained and participants given the opportunity to raise any questions. The purpose of the questionnaire was explained in terms of interest in students' perceptions of the nature of critical thinking. The questionnaire (Appendix 1) was issued to and completed by twenty one students in a familiar classroom environment. Participants were encouraged to complete all of the open questions. The questionnaire was completed in silence and the students appeared to reflect thoughtfully on the prompt questions.

The questions themselves were numbered and in a fixed sequence, with no flexibility to the wording, and therefore inevitably set a structure which channelled the communication of participants' views into the researcher's framework. This is perhaps most evident in the inclusion of questions eliciting views on the relationship between critical thinking and other subjects (questions 3,4,5), given prominence because of the philosophical and pedagogical dispute concerning the possibility and efficacy of standalone or embedded critical thinking programmes (sections 3.3.5, 3.4.3).

The coding of responses was not pre determined. Individual responses to each question were collated and analysed for key patterns and themes (Appendix 2). The analysis proceeded from identification of recurring terms and themes to a frequency count. This was supplemented by selection of exemplar material, in the form of illustrative examples; answers which acted as composites, capturing elements of multiple responses; and in thematically significant statements. While the text of the responses was itself a starting point for analysis as in the 'pure' form of grounded theory advocated by Glaser and Strauss as "the discovery of theory from data" (1967: 1), the researcher's approach is a realist one which acknowledges the inevitability of prior knowledge and understanding

guiding the interpretation of the significance of material. It is therefore "interpretive work" (Strauss and Corbin 1998: 160) by a "theoretically sensitised" researcher (p.167) initiating "conceptual density" (p.161) in an analysis which is contextualised by the main themes of the thesis. It includes "the perspectives and voices of those whom we study" (p.160) whilst at the same time these have "become incorporated into our own interpretations (conceptualizations)" (p.74).

Commentary on questionnaire findings

Q1: How would you define the term critical thinking?

Asked how they define critical thinking, most of the student respondents (17/21) answered in terms of argument skills, referring to the analysis (10/21), development (13/21) and evaluation of argument (8/21). For one respondent it was described simply as "the study of argument". It is recognised that students' views are not expressed in a vacuum but from within their social setting, which includes the form of critical thinking embodied in the syllabus, assessment scheme, resources and learning practices they experience. Their responses were well aligned with the Cambridge Assessment Group's definition of critical thinking that underpins the A level syllabus. This has at its core:

- *Analysing arguments*
- *Judging the relevance and significance of information*
- *Evaluating claims, inferences, arguments and explanations*
- *Constructing clear and coherent arguments*

(Black 2008: 7)

To this extent the students' definitions match the view of critical thinking prevalent in the movement associated with Ennis, Scriven and Fisher (section 3.3.1). Several comments implied it is about quality of thinking, argument or judgement, including "to think about things more thoroughly" and "to make a fair judgement in any circumstances". For one respondent it entails "taking time over things, breaking down and analysing, studying arguments" while for others it means "to be able to think clearly or fast in critical conditions" or "the ability to think calmly, logically and quickly even whilst under pressure". These responses suggest that the students not only describe critical thinking in terms of the application of skills but that they have acquired a critical thinking orientation. This orientation includes dispositions such as 'fairness' and also a sense of how to approach thinking tasks to ensure quality of judgement. It would appear that they have gone some way to becoming critical thinkers in the sense described by Bailin *et al.*: "in order to become a (more) critical thinker one must understand what constitutes quality reasoning, and have the commitments relevant to employing and seeking quality reasoning" (1999a: 281).

Q2: What have you learnt by doing a course in critical thinking?

Prompts: ***What do you know as a result of studying it?***
What can you do as a result of studying it?

Most respondents (17/21) described learning in procedural terms (know 'how to'), only a few (3/21) in propositional terms (know 'that') despite inclusion of prompts which invited comment on both. For one student, "what I know as a result in studying critical thinking are the flaws in arguments in greater depth". Another referred specifically to "learning about utilitarianism and duty ethics", which is part of the A level Unit 3 on Ethical Reasoning that the group had recently begun work on. The other two propositional statements concerned knowledge of how arguments are structured and what makes them stronger or weaker. The vast majority of respondents answered by referring to improved knowledge of how to analyse, evaluate and develop arguments - key areas for assessment - making specific reference to the identification of flaws and judgements of credibility. One student offered a list which sums up various aspects found across other replies:

> *I have learned how to recognise flaws and rhetoric in arguments.*
> *I have learned how to overcome and win arguments.*
> *I have learned how to think whilst arguing.*
> *I have learned how to stay calm during arguments.*
> *I have learned how to analyse documents and articles and know whether they are good or not using the BRAVEN system [sic, CRAVEN is a standard acronym for remembering credibility criteria]*
> *I am learning about utilitarianism and duty ethics.*

Reference to identifying flaws was especially commonplace (10/21), though while this is a form of procedural skill, it also presupposes knowledge and understanding of what flaws are. Personal dispositional qualities such as 'stay calm' were mentioned in a number of responses, notably a questioning attitude, "not just take things as it is" or "be persuaded so easily than before the course by ''any old'' information". These statements represent a rejection of the 'uncritical thinking' Dewey had warned against (section 3.2.1) and align with Lipman's description of the defensive role of critical thinking "to protect us from being coerced or brainwashed into believing what others want us to believe" (2003: 47).

As in answers to question 1, a number of statements commented on improvement in the *quality* of skills, especially in being better at or winning arguments or debate (14/21). This suggests growth of personal confidence in ability to take up and support a position and "the willingness to challenge, to disagree and to seek or accept a challenge" which Moon describes as a feature of 'academic assertiveness' (Moon 2008: 81).

Q3: Has critical thinking affected the way you approach studying other subjects?
Prompts*: If yes,*
(a) Please explain how
(b) Please give a specific example of how you have used critical thinking skills in another subject (or state if you are unable to do so)

Most participants responded in the affirmative to this question (17/21) and commented positively about the impact. In several cases (7/21) this was expressed in dispositional terms as the following two examples illustrate:

> *I do sociology and I have to evaluate theorists and their theories. Critical thinking has made me question their theories more and not accept what they say as always right.*

> *I study sociology and we get to look at a lot theories by various theorists and when I look at the point they are making sometimes I question and I ask myself if this is right or wrong.*

Both of these responses convey a questioning attitude with which the students neither expect nor accept knowledge presented to them as a given. This confirms the positive effect of studying critical thinking on academic assertiveness, going further than the 'willingness to challenge' noted above as it appears to give confidence in "the ability to be autonomous; a willingness to be proactive; to make and justify independent judgements and to act on them" (Moon 2008: 85). This is illustrated succinctly in another student's explanation: "Yes. More confidence to say my view and assess other people's views. Also that what I am saying can be supported by relevant appeals and experience". However, it cannot be concluded for certain that studying Critical Thinking has created this critical confidence, as this effect cannot be disentangled from the impact of other A level subject teaching on developing critical thinking skills and dispositions. This is especially true of the several students in the sample who also studied Sociology, given their affirmative responses to question 5.

For other respondents it meant taking a more considered approach, such as the student of English who saw critical thinking as "teaching me to sit and think before approaching a question". In a small number of cases the value of critical thinking to other areas was couched in terms of study skills, notably in planning essay writing, whilst numerous references were made to identifying 'strengths and weaknesses'.

Some responses noted a direct transfer of a critical thinking focus to understanding or evaluation of subject based material, "In Philosophy when philosophers use analogies to describe their point such as Paley's use of the watch, applying it to the universe. My

knowledge of what an analogy was from my work in critical thinking helped". A detailed response referring to AS Psychology explained that

> *critical thinking helped me realise that the evidence from the research that was carried out could not be universally applied as such a small amount of people were used for the experiments and usually from a small area, this led me to a certain point distrust a lot of experiments and the conclusions drawn, as in one experiment 11 people took part from a small town, which is not representative at all.*

We cannot know whether this student would have acquired a similar level of awareness of issues of representativeness without having studied Critical Thinking; however, at the very least critical thinking has given clarity and confidence to the student's grasp of this aspect of the use of evidence. In another case a student appeared to transfer the value of analysis and composition of structure in verbal reasoning to visual imagery: "In critical thinking we separate sentences as they have different functions. This is the same as photography, instead I separate the photo in sections and develop further". These examples suggest critical thinking awareness and skills are closely intertwined with a logical and evaluative approach within other subjects; they are integral to a deep approach within these subjects that involves "examining the logic of the argument" and "interacting vigorously and critically on content" (Entwistle 1991: 1) and are far from antithetical to the knowledge curriculum as suggested by Young and Furedi (section 2.3). They also provide endorsement for a pedagogy of general skills teaching in which "the domain of practical affairs offers a natural context for teaching task-related concepts, skills and heuristics in a way that will encourage knowledge-transfer to other domains" (Smith 2002: 675). This runs counter to Johnston *et al*.'s claim that "approaches which suggest de-contextualized critical thinking skills can be taught separately from content knowledge are likely to be ineffective because of transfer problems" (2011: 51-2). From Smith's perspective 'de-contextualized' is a misnomer as there must always be some kind of context in which thinking skills are developed and the use of examples that learners can relate to will enhance confidence in identifying opportunities to apply skills in other contexts, especially if the skills have been built up with 'procedural specificity'.

Of those indicating critical thinking had not affected their other studies (4/21), two stated this in blanket terms, while the other two attributed it to the subjects they were studying, "not at the moment as I am only studying a sport qualification" and "as I do Art based subjects I do not use critical thinking in my subjects". In addition to a student taking Critical Thinking alongside a BTEC National in Sport, two of the others in this group studied A level P.E. and two of them Film Studies. While no students gave illustrative

examples of critical thinking's influence on P.E., views were more mixed on Art and Photomedia courses.

There was frequent mention of the applicability of critical thinking to Sociology, Psychology and English and these made up a significant proportion of the cohort (12/19 that indicated their courses). Only one student followed a traditional 3 science A level programme and no comment was offered on the applicability of critical thinking to these. The greater likelihood of take up of Critical Thinking alongside social science and humanities subjects is of note and may reflect a synergy with these subjects, supported by answers to question 5, though it could be a consequence of admissions policies at East College (equivalent national data on subject combinations is not included in Black's profile of Critical Thinking: 2009a & 2009b). The trial cohort at West College included students following a mix of arts, humanities and science A levels, and students were less likely to cite examples of the application of critical thinking in science subjects. One participant noted identification of "the post hoc flaw and confusing correlation with cause in Biology", while a more typical non-committal response was a Maths and Physics student who indicated that the effect of critical thinking was "not very much, mainly because the subjects I am taking don't involve material which may enable me to do so".

A potentially interesting line of inquiry in wider research would be to explore the extent to which different subject cultures embody, exclude or even resist critical thinking principles; and in turn whether the less 'critically compatible' subjects are more information or performance led and/or are more likely to be taught in a way which encourages a surface rather than a deep approach to learning (Entwistle 2009: 36).

Q4: Are skills from your critical thinking course enough to enable you to evaluate material effectively in other subjects?

Prompt: *If not, what else is needed?*

The intention of this question was to ascertain whether students felt that the generic skills approach to critical thinking encouraged by their course was sufficient to evaluate subject based material effectively. Most students (16/21) replied in the affirmative and four said it was not. Interestingly one respondent observed that it depends on the subject

> *Not suitable for Maths where opinion isn't so necessary. But for Business you always have to make decisions and being able to decide whether the advantages outweigh the disadvantages is vital.*

Three of the negative responses stated that critical thinking was not useful at all in evaluating material in other subjects and these were the same three respondents who said it had not affected their approach to other subjects in question 3 (two studying

PE/Sport and one Art). The fourth negative respondent was the only one who appeared to have grasped the focus of the question on sufficiency, "No because I need some skills from my other subjects to help but my critical thinking skills are useful". The limitations of the questionnaire method are evident here, as no further explanation was elicited. Most of the positive responses observed the *usefulness* rather than sufficiency of critical thinking. This was mostly in terms of a sensitizing orientation to aspects of credibility and data reliability in other subjects or in terms of evaluating material or identifying strengths and weaknesses.

This question had been altered after feedback on the first iteration of the questionnaire trialled in West College, but the significance of its wording was not apparent to learners who were not themselves aware of the academic debates about whether critical thinking can be effective on a standalone generic basis separate from particular knowledge contexts. It also presupposes too much with regard to students' capacity to recognise evaluative effectiveness, interpreted as relevance by some, let alone judge the contribution of critical thinking to this. It may be that this issue would have been better addressed by asking subject teachers for their assessment of learners' evaluative skills, comparing those studying Critical Thinking to peers who were not studying Critical Thinking. However, some insight into the matter was gained through the follow up response to quotes activity, and further material of relevance emerged in the subsequent teacher activity.

Q5: To what extent do other subjects teach you critical thinking skills?

The responses overall suggest that critical thinking skills are not taught to any significant extent in other subjects. In some cases (6/21) the perception was that there is no or negligible teaching of critical thinking. In two cases this was attributed "to the current subjects I am taking" [Textiles] and "my other subjects do not (Physics, Maths, Chemistry)". One implied that it is not something that can be taught, "Critical thinking skills can be said to be skills that we develop naturally anyway but I do not think that my other subjects do teach me these skills" [Psychology and Religious Studies]. On the other hand, one respondent saw it as the preserve of critical thinking specialists:

> *I feel that other subjects do not teach critical thinking skills. Critical thinking I feel is a skill which can only be taught on a critical thinking course. Subjects should not try and teach as I feel they would get it wrong.* [BTEC Nat Sport]

Another student contrasted the generic critical thinking approach with subjects where substantive content is the focus: "it is more work [subject] based than discussion based as anyone will be able to join to critical thinking, but others you will need to have the knowledge first" [Photography, Psychology, Health and Care]. One respondent felt

teachers in other subjects expect to see these skills but do not directly teach them, and suggested that this could have significant consequences:

> *Other subjects would expect you to know and be able to use these skills in the subject. That is why some people drop out of subjects. They have an interest but are unable to cope with the work.*

This contribution is significant in the context of discussion concerning embedded or discrete teaching of critical thinking skills. The student recognizes the importance of these skills for progression in other A level subjects but questions the adequacy of teaching and assessment practices which leave them taken-for-granted. In this respect the response offers support for Fisher's contention that critical thinking skills should be taught "explicitly and directly" (A. Fisher 2001: 1).

A large number of respondents (13/21) suggested that the extent of critical thinking teaching in their other subjects is limited, either to individual subjects or in terms of the specific aspects of critical thinking addressed. Both forms of delimitation are captured in these responses: "Sociology teaches me how to evaluate but other than that they don't" and "the other subjects that I do don't teach any critical thinking skills, save perhaps analysing in English". In one case this was seen as a consequence of other subjects being "based on facts and not opinions".

These responses generally stated that there is some analysis, evaluation or debate in other subjects but little detail was given and it was frequently noted that critical thinking takes these skills further:

> *Other subjects teach you simple evaluative techniques which critical thinking expands on such as you're taught about making sure evidence is reliable but with critical thinking you are taught to take more into consideration.*

It would appear that students had used their working definitions (question 1) of critical thinking to answer this question, with this providing a conceptual yardstick against which to compare their experiences in other subjects. There was no recognition or suggestion that other subjects might encourage different forms, criteria or standards of critical thinking. The overall impression left by the responses is that Critical Thinking adds significant value to the teaching and development of their critical thinking skills in other subjects but that this is not reciprocated or complemented by any distinctive development of such skills in the other subjects.

Q6: Has studying critical thinking affected you in any ways beyond your course of study? (please explain how)

All respondents answered in the affirmative when asked whether studying critical thinking has had an impact on their lives more generally, though one said 'not much'. The impact was described positively, most commonly in terms of enhanced effectiveness in argument or debate (16/21 replies). This was sometimes linked specifically to everyday debate with family members and friends (6/21). A large number of respondents (13) also mentioned gains in personal confidence or other dispositional changes including being "open-minded", taking "a logical approach in life" and in being "more argumentative". There was also a sense of not accepting things at face value, "I question the news quite a lot". The following response encapsulates the range of elements found across other answers:

> *Yes, the quality of arguments I have with people has improved because I no longer accept their conclusions from their reasoning so easily. And other times I can recognise the reliability of a source of information and decide whether it is plausible/believable. Also, I can see what people do to avoid saying things (e.g. politicians) that they are asked, but they divert the attention away. Also, I can evaluate some peoples reasoning and come to a good conclusion about their argument and whether to accept it or not.*

As in the answers to questions 1 and 2, there is a strong indication that studying Critical Thinking has affected students' confidence in analysis and evaluation, their perceptions of the quality of their arguments and judgements, and their dispositions. While Barnett is sceptical that critical being is a necessary corollorary of critical thinking (1997: 77), there is some evidence of an impact on these students which stretches beyond their studies and into broader aspects of the life world. They thus lend support to the view of Scriven that systematic development of critical thinking skills will "improve your critical instincts" (1976: ix). The accounts given by the students illustrate the benefits of critical thinking to personal development and democratic citizenship claimed by those in the critical thinking movement (section 3.3.4).

5.3.2 East College case study: implementation and analysis of adapted Nominal Group Technique

After all students had completed the questionnaire, they were split into two groups of nine and twelve. This was to create more workable group sizes for the discussion activity that would follow voting in response to a series of statements about critical thinking, sourced from a range of 'expert' texts (Table 5.2). The quotations were numbered and presented on screen in turn and to avoid any distraction from the meaning of the statements, the sources were not given with the quotes. Students were issued with handsets that enabled answers to be registered using an electronic voting system linked to the programme software. Initial responses were therefore confidential and anonymous,

identifiable only by number of handset. The responses were not revealed until all quotations had been presented and voted on. It was necessary for the researcher to offer an explanation of phraseology used in some of the statements: 'formulaic' in quote 1; 'unenviable position' in quote 7; '*in vacuo'* in quote 9. This had been anticipated as uncertainties arose in the earlier trial run at West College. It was decided to retain the authors' original statement wording so that their intentions were not lost in translation or paraphrase. Also in the light of the trial group response, a verbal explanatory gloss on the overall meaning of statements 9 and 13 was provided. Despite these attempts at clarification, some problems and differences of interpretation did arise (noted below).

The results of the voting exercise were captured and aggregated by the software of the 'Classroom Performance System'. A summary profile of all the voting responses is given in Table 5.2. The aggregated data on responses to each statement was displayed as a stimulus to further discussion in the group phase (Appendix 3). The statistical and bar chart representations of votes were discussed for each question in turn; however, there were delays in the recall and presentation of the information due to limitations in the operation of the software, which led to restrictions on the time available for discussion. Consequently discussion in the second group was curtailed before the final four quotations could be considered.

The group discussion phase engendered thoughtful reflection from the participants. Students in the first group, characterised as 'lively' by the teacher contact, readily discussed the thinking behind the profile of responses, offering explanation and examples from their own experience. Unfortunately the richness of responses from this group was not fully captured as a result of failures in the operation of the recording equipment used. Notes from the discussions were kept by an assistant, but were summative, not literal, and provided a poor substitute for a full audio recording. The second group, characterised as 'serious' by the teacher contact, were less forthcoming and one more confident individual was the chief volunteer of unsolicited responses. It is possible that the conduct of the group discussion was perceived in the way that having a class with an unfamiliar teacher would be, and for some this would be an inhibiting factor. The physical layout probably contributed to this as the teaching room used was set up as usual, and the researcher operated from the teacher's normal position centrally at the front of the room. In the context of this environment and in the position of a teacher researcher, the dynamics were like that of teacher with students. It seemed appropriate to manage the discussion as a teacher might: hence 'classroom management strategies' were adopted to elicit responses from a wider range of contributors through encouragement and direction of questions to specific individuals. A full transcript for the second group is included as Appendix 4. Using teaching techniques in the research and viewing the research as a learning situation fits with the context in which the research took place,

matching the realist approach advocated by Pawson and Tilley, for whom "context refers to the spatial and institutional locations of social situations, together with the norms, values and interrelationships found in them" (1997: 216).

Commentary on response to quotes and group discussion

The statements used in the activity included various aspects of the nature and definition of critical thinking (CT):

- 4, 8 are statements which support the idea of CT as a set of generic, transferable reasoning skills
- 2, 10 concern the relationship between CT, decision making and democracy
- 3, 12 focus on whether CT is skills based
- 6, 11 focus on whether creative thinking is part of CT
- The remaining statements all focus on the relationship between critical thinking and knowledge (1,5,7,9,13,14)

There was a consistently high level of support for the idea that critical thinking is concerned with argument analysis and reasoning and that this form of critical thinking is desirable and beneficial to democracy. The equation of critical thinking with argument analysis in responses to quotation 4 (18/21 agreed) is consistent with the questionnaire responses that defined it in these terms and is explained in comments from group 1 that "exams [in Critical Thinking] are based on this" and "we spend a lot of time doing this" while a student in group 2 noted that "it's part of the definition of it". However, not all agreed that the *ultimate* goal of critical thinking is to learn to evaluate arguments. Three students disagreed, emphasising that critical thinking is not only about responding to others' arguments but also "we develop our own skills in writing arguments" and have "learnt about ethical principles" (group 1). Evaluating arguments is not seen as the *end* point of critical thinking for these students as it engenders proactive as well as reactive capabilities. This perception that critical thinking offers something more than argument analysis also finds expression in the further benefits claimed in relation to personal decision making and the effectiveness of democracy (quotations 2 and 10, discussed below). The majority (19/21) agreed with statement 8 which also claims that critical thinking develops analysis and evaluation of ideas and arguments. This statement elicited the highest number of 'strongly agree' responses (13/21). The two participants who disagreed with this statement questioned the claimed applicability across all subject domains. One student in each group said it is not possible to use critical thinking skills in studying Art: "I disagreed, I don't think you can apply it to Art when Art is just about expressing yourself" (group 2). As noted earlier there were mixed views in the questionnaire responses on its applicability in Art contexts.

Table 5.2 Aggregated voting preferences in response to quotes

Quote	A strongly agree	B agree	C disagree	D strongly disagree	Total agree	Total disagree	Not answered
1	'*Critical thinking skills' are anything but critical. These are taught as a formulaic technique as prescriptive as teaching six year olds to memorise their tables*						Furedi 2009: 179
1	0	1	16	4	1	20	0
2	*The end product of critical thinking is someone who is open to multiple points of view, assesses those perspectives with reason, and then uses the assessment to make decisions about what to believe and what action to take*						Browne& Keeley 2007: 54
2	10	11	0	0	21	0	0
3	*Critical thinking is an academic competency akin to reading and writing*						Scriven cited in Fisher 2001: 10
3	1	13	6	1	14	7	0
4	*Our ultimate goal in studying critical thinking is to learn to evaluate arguments*						Le Blanc 1998: 1
4	5	13	3	0	18	3	0
5	*It requires only a relatively slight knowledge of any subject to evaluate arguments relating to it oneself*						Fisher 2004: 1
5	1	14	4	1	15	5	1
6	*Creativity plays an important part in thinking critically… it requires imagining possible consequences, generating original approaches and identifying alternative perspectives*						Bailin *et al.* 1999b: 288
6	4	13	3	1	17	4	0
7	*In critical thinking the student is placed in the unenviable position of having to assess arguments without the necessary information*						McPeck 1981: 28
7	2	5	9	5	7	14	0
8	*Critical thinking develops the ability to interpret, analyse and evaluate ideas and arguments and can support thinking skills in all subject areas, from arts and humanities to sciences*						OCR 2008
8	13	6	2	0	19	2	0
9	*Learning to reason* in vacuo *…is fruitless and sterile …learning to reason substantively involves learning about the actual subject areas*						McPeck 1981: 81
9	0	8	8	5	8	13	0
10	*Critical thinking is crucial to creating and maintaining a healthy democracy*						Brookfield 1987: 1
10	9	10	1	1	19	2	0
11	*Creativity is not an essential skill for critical thinking*						Black 1999b: 288
11	1	8	9	3	9	12	0
12	*Critical thinking is not a skill like riding a bicycle, which one learns and then possesses for all time. Rather it is a disposition that grips the mind in certain circumstances*						Furedi 2004: 1
12	4	9	4	2	13	6	2
13	*Problem solving and critical thinking are unnecessary in a conceptually strong curriculum*						Young 2009: 2
13	0	4	10	7	4	17	0
14	*Background knowledge in the particular area is a precondition for critical thinking to take place. A person cannot analyse a particular chemical compound without knowing something about chemistry, and without an understanding of certain historical events a person will be unable to evaluate competing theories regarding the causes of World War 1*						Bailin *et al.* 1999a: 271
14	3	12	4	2	15	6	0

All respondents agreed that studying critical thinking leads to openness to different points of view and to taking informed and reasoned decisions (quotation 2). One participant (group 2) noted that "you've got to be like open minded…you have got to think about the other side of the argument and, like, so you can counter what they write so you need to understand it from both points of view to make an argument". This is consistent with the emphasis on critical thinking orientation and dispositions evident in the questionnaire responses. The idea of reasoned decision making is picked up in explanation of the importance of critical thinking to democracy indicated in responses to statement 10 (19/21 agreed it is crucial to it):

> *Democracy's about y'know the vote or the individual and their voting power and if people can understand the position where politicians come from they can make a just and informed decision about it so [as] they know what people are talking about* (group 2)

On the other hand, without critical thinking it is possible "you might just like accept the point and be persuaded rather than question it" (group 2) or as another student (group 1) put it "critical thinking means you don't just follow the crowd". This is entirely consistent with Dewey's rejection of uncritical thinking (section 3.2.1) as with answers to questions 2 and 6 of the questionnaire. The significance attached to critical thinking as an essential component of democracy also echoes Dewey's views on the role of reflection in education and the centrality of this to democracy (Dewey 2005 and section 3.3.3).

Responses to quotation 3 suggest that the majority (14/21) agree that critical thinking is a kind of core skill. In the discussion some felt it is essential, like literacy and numeracy, because "you need it all the time once you have learned it (there are lots of occasions to use it)" (group 1), though for others "it's not so basic as there are a lot more different elements" (group 2) and "it doesn't come naturally…it's not automatic" (group 1). Another student justified its equivalence in terms of importance rather than function "I think it is as important coz you are always going to have arguments…about stuff…it may not be as simple but it is as important". On the other hand one participant argued that it is "not a core subject like reading and writing …it is more useful in some subjects like English than others like Maths and Science" (group 1). Despite the majority viewing it as an essential competency, not all viewed it as a set of skills that could simply be learnt and used. This is evident in the responses to quotation 12 in which the majority agreed it is not "a skill like riding a bicycle which one learns and then possesses for all time". This was explained in terms of a need for repeated practice to be able to retain and use critical thinking skills as it does not happen automatically; however, this may reflect the position of students part way through a critical thinking course who lack full confidence in their capacity to call up and use the skills in any situation as they would their linguistic

capabilities or ability to ride a bicycle. Another view expressed in group 1 was that the attitude of mind and approach it nurtures were more important than a specific set of skills, again an emphasis on dispositions. This was conceived in terms of the "tentative scepticism" advocated by Lipman (2003: 47) and is consistent with the discussion of statement 10 in group 2, in which the questioning attitude encouraged by critical thinking was seen as essential.

Two quotations offer views on the link between critical thinking and creativity. There was a high level of support for statement 6 (17/21 agree), which spells out how critical thinking can involve creativity. This accords with the views of not only Bailin *et al.* (source of the quote), but also Dewey and Ennis (section 3.2.1), all of whom see creative thinking as involving the imagining of consequences (hypothesising) and therefore as integral to a critical thinking approach to problems. This is well illustrated in a student contribution (group 2):

> *you've gotta kind of like… if you can't think of like the consequences and things of what you're arguing about…then what are you arguing for coz then erm after you've argued the point what would happen like right? ……yeah, like your earlier one [example] about multiculturalism what would happen if like all the cultures split...y'know...it'll be bad.*

Quotation 11 offers an opposing claim, more explicitly stated, that creativity is not essential to critical thinking, which fewer accept (9/21). However, the number rejecting this (12) is lower than that supporting statement 6. This would appear to reflect semantics as those rejecting it had in mind a form of artistic creativity rather than hypothesising: "it doesn't involve creative thinking like art …painting" (group 1). However, interpretations differ even with this 'artistic' vision of creativity as shown in this imaginative analogy:

> *its similar to like erm artists using their paints…they have a certain set … produce a certain set of skills in critical thinking you've got to use…its how you use those in an argument or a real life situation…you'd be creative you might have examples but you might not use them coz they aren't strong enough* (group 2)

This comparison bears a striking resemblance to Lipman's initial discussion of creativity (2003: 243) and connects with Brookfield's claim that critical thinking is "an artistic process…It is intuitive, improvisational and creative" (1987: 155). The 'artistic' interpretation of creative thinking was more likely with quotation 11 as it did not convey the alternative meaning indicated in quotation 6, so it is not entirely surprising that the level of support appears inconsistent. It is unclear on what basis Black rejects creativity as a facet of critical thinking, given the consensus around its role amongst those in the

critical thinking movement that have heavily influenced the Cambridge Assessment Group's definition of critical thinking and the related A level syllabus content. Lipman provides a developed discussion of the relationship between creative and critical thinking and includes an extensive list of possible defining characteristics. These include 'originality' and 'independence' (2003: 245) with value placed on the uniquely individual; it is perhaps this which explains Black's rejection as it would be difficult to accommodate in a critical thinking assessment based on "a meticulous and rigorous approach" (Black 2008: 7). Lipman goes on to distinguish creative from critical thinking by suggesting it goes further than hypothesising consequences or solutions to problems, involving a capacity to redefine the very nature of the problem itself: "creative thinking is the fabrication of the problematic" (2003: 254) and is a force for the renewal of critical thinking:

> *This jettisoning of the old problematic, product of the previous critical thinking, and its replacement with the new problematic, freshly and richly permeated by doubt, is what creative thinking consists in. So, inquiry needs also creative thinking.* (Lipman 2003: 254)

Lipman simultaneously differentiates critical and creative thinking and indicates not only that they are compatible, but that they are inextricably linked.

Several of the quotations used offer positions on the question of whether critical thinking can be regarded as a generic set of skills and dispositions or can only be realised effectively in the context of particular subjects or fields, in particular whether it is knowledge-dependent or knowledge-independent.

The first quotation contains a claim about the pedagogy of critical thinking which suggests that a rote learnt set of procedures are followed, and it carries the implication that this is an empty process which disregards the meaning of texts analysed. All but one participant disagreed with this statement of Furedi's, with students keen to emphasize that they examine and question the content of material analysed and that they consider alternative viewpoints on issues discussed (group 1). Students pointed out that there is not a set formula to follow but rather "you've got to think about things" and "there's a lot of things you have to consider to help you see things logically". Furthermore "it can be used in real life situations as well… like if you are given some information you can make a better decision than if you hadn't had the knowledge of critical thinking". As in responses to question 6 of the questionnaire, there is recognition of the transferable life skills nurtured by study of critical thinking. Also where the teaching of [times-] tables elicits "a fixed set of answers", "with critical thinking you can have multiple outcomes" (range of contributors in group 2).

A second quote from Furedi was provided in statement 9 and this contains judgements about both pedagogical effectiveness and how the curriculum is experienced. The statement suggests that development of reasoning skills is pointless and unproductive if practised outside the context of particular subjects, and by describing this as 'sterile' Furedi appears to assume a formalistic approach which is not engaging to learners. Responses were quite evenly divided, with eight respondents agreeing and thirteen disagreeing. The split response in this case may reflect uncertainty over the meaning of the statement as one student (group 2) indicated "I don't get what it means by doing it in a vacuum". In the course of discussing both the meaning of the statement and participants' responses, it also became apparent that students expressed agreement or disagreement with different parts or interpretations of the complex statement. Even those who agreed that learning *in vacuo* is fruitless and sterile did not believe it applied to their learning as they felt that they did have relevant knowledge of topics considered (group 1) and that "you can take what you learn from it…and use it in other lessons…like in Psychology…you can use all the stuff you know to look at is that true or is it not?" (group 2). This accords with the majority response to statement 7, on which most (14/21) disagreed that they lacked sufficient information to assess arguments. Those who agreed took the view that "if you don't know a subject how can you have an opinion on it" though one response to this (group 1) was to argue that "you can analyse critically, just not as well...not as thoroughly". This is an interesting observation on limits to the scope or reach of generic thinking skills when applied to specialist subject content. It was further suggested (group 2) that it was a challenge rather than an impossibility to evaluate material without specialist knowledge. The responses overall lend support to Smith's view that "although domain knowledge might help one make related assessments within a domain, useful evaluations can be made without this specialized knowledge" (Smith 2002: 668).

With further prompting on this issue "Do you think you can cope with most things…what about a bit of physics or…cosmology…or something you didn't study in any shape or form?" (researcher), one participant (group 2) acknowledged that "you can't do anything without information in physics like unless you're given like results or something, you can't do anything, but in critical thinking you can". The implication here is that students have sufficient knowledge to deal with material analysed within Critical Thinking classes "coz you know things from experiences, your memories and your opinion" but this might not be the case in a specialist knowledge domain such as Physics. This begs the question of whether students would be capable of carrying out analysis and evaluation of a piece of Physics discourse in a critical thinking class, or attempting a critical thinking analysis in a Physics class. One student response suggests a kind of immutability of knowledge in

Physics which might reflect a particular conception of scientific knowledge in general which is not open to critical scrutiny:

> *Physics is like a.. its there that is it deal with it because that's the data… y'know if you get that from an experiment you cant just like well ' that cant be it' because that is it* (group 2)

Differences in response to question 9 may not directly reflect differences in opinion regarding the potentiality for critical thinking without specialist subject knowledge, as some students who disagreed were thinking of what goes on in their Critical Thinking classes rather than with the abstracted concept of critical thinking assumed by Furedi, while those who agreed had done so in terms of the abstract principle. Indeed one of those who agreed had interpreted it in terms of being asked to take a side of a debate that they would not choose and feeling put on the spot to come up with alternative arguments in support of a position they were not committed to.

In response to statement 14, the majority (15/21) took the view that knowledge of subject matter is essential if any meaningful critical thinking is to take place. This might seem to contradict responses to statement 5, where most agreed that only slight knowledge is needed. However, the phrase 'background knowledge' does not specify how slight or substantial that knowledge must be and it is not necessarily contradictory to have agreed with both statements. In any case in the discussion it became apparent that students related this to their own Critical Thinking classes, where they felt they had enough knowledge of topics discussed to bring their critical thinking skills to bear. What they agreed with is that some knowledge base is necessary but this falls short of endorsement of the idea that critical thinking is only meaningful in a field dependent form.

Statement 13 implies that there is no need for an explicitly identified critical thinking approach if subjects are 'conceptually strong', a description carrying connotations for both the construction of the curriculum and the teaching of it. Most disagreed with this (17/21) and students (group 1) expressed the view that separately taught critical thinking is needed even if the content of subjects is well taught as subject teachers lack the specialist knowledge of critical thinking. This matches questionnaire responses suggesting that specialist expertise and focus is needed if critical thinking is to be developed effectively. However, in taking the view that critical thinking is necessary even in a 'conceptually strong curriculum' it is not known whether respondents meant alongside or within that curriculum, and hence the significance to the debate about field dependence or independence of critical thinking is reduced.

A recurring complication in the use of original quotations as the basis for agree/disagree statements is that these quotations are often multifaceted and nuanced in emphasis, and

it is not possible to know which part of the statement is the focus for agreement or disagreement, notably quotations 1, 4, 8, 9. This may be construed as resulting in problems of construct validity. However, the quotations were not chosen to simply and unequivocally represent particular views on critical thinking, nor was it ever intended that the numerical agreement count would stand alone. Both the prompts themselves and the basic responses captured in the agreement count were used to open up more in depth exploration of different ways of seeing critical thinking and its relationship with other fields of study. The voting preferences activity was thus designed to work together with the group discussion that followed to produce a more detailed and refined collective analysis. The method challenged students to take a more detached and reflective approach to the meaning and practice of critical thinking, resulting in examples of complex analysis such as the discussion of critical thinking in relation to Art and Physics. The students' critical thinking skills were evident not just in the meta reflection about critical thinking, but also in the careful attention paid to specifics in the statements encountered, showing a "demand for exactitude" (Lipman 2003: 233) and concomitant subtleties of interpretation.

5.3.3 West College: Teacher response activity

Conduct of research and analysis

A range of texts were selected from past A level Critical Thinking papers used in examinations between 2006 and 2010. Five of the six texts were from the A2 synoptic Unit 4 (Critical Reasoning), with the sixth taken from an AS Unit 2 (Assessing and Developing Argument). The material presented in examinations provides a basis for a series of analysis and evaluation questions, and is designed to be accessible regardless of students' other fields of study: "Candidates are not expected to have extensive prior knowledge of the topic used in stimulus material" (OCR 2009: 19). Material from these units was selected in preference to equivalents from Units 1 and 3 which have, respectively, a specific focus on issues of credibility and ethical choices. A variety of subject matter is used in Critical Thinking examinations and "the aim is to provide candidates with a framework, which can be applied in a practical manner to a range of materials, situations, problems and issues" (OCR 2009: 7). Sometimes, in seeking to provide stimulus material that is non field specific, topics with an apparent connection to the general experience of 16-18 year old A level students are used, such as texts on the length of school summer holidays, gap years or the value of degrees. In some cases, however, the content of general interest articles may have a focus which is linked to that which might be found within particular subject areas. Both as a practitioner teaching Critical Thinking and as a researcher, this has aroused curiosity in terms of how subject specialists might expect students to critically evaluate such pieces, and how this compares to what is expected in the context of a Critical Thinking exam. The purpose of

this method is therefore to gain insight into the extent to which the focus, skills and processes of critical thinking which are valued highly in the formal assessment of a standalone Critical Thinking exam are similar to what might be expected from a subject specialist point of view, in response to the same material. It also provides an opportunity to compare the perceptions of teachers on the forms critical thinking might take in their subjects with the views expressed by students on the relationship between critical thinking and other subjects.

Six past paper texts were selected on the basis of the researcher's judgement that they had clear connections with areas of interest in specific subjects. They represented a spread of curriculum areas, with two linked to science, engineering and technology; two to social sciences and two to arts subjects (Table 5.3). The teachers approached to participate are all experienced A level teachers, including three heads of department.

Table 5.3 Sample material and participants in teacher response activity

Original article	**Source**	**Critical Thinking Paper**	**A level subject specialist**
New technology may be changing the brain	Jackie Ashley, the Guardian 24.4.06	Unit 4 June 2007	Information & Communication Technology
Who's afraid of a synthetic human?	John Harris, the Times 17.5.08	Unit 4 June 2010	Biology
Instead of spending a fortune getting rid of graffiti, why don't we just give it marks out of 10?	Germaine Greer, the Guardian 24.9.2007	Unit 4 January 2009	Art & Design (Art History)
The dangers of television	Not provided	Unit 2 January 2007	Media Studies
You could be a genius too	New Scientist 16.9.2006	Unit 4 June 2008	Psychology
Street policy named bizarre	Libby Purves, The Times, 31.1.06	Unit 4 January 2007	Sociology

This part of the research was carried out in West College, the researcher's own institution, for practical reasons: personal knowledge of relevant expert staff in each field; ease of issuing and collecting responses and ability to clarify instructions as necessary; opportunity to benefit from people's willingness to assist a colleague and the organisation. Each of the six staff approached completed and returned the task within

the requested time frame. It was anticipated that they may have agreed to participate under a sense of obligation to someone perceived as representing the College management; however, the approach made was peer to peer not directive, and in the follow up meeting, participants confirmed that they took part voluntarily and out of interest. Two staff raised concerns at the point of being asked to complete the task: one stressed that students in the subject concerned were not normally expected to carry out critical evaluation of the form requested; the other was concerned in case the intention of the research was to devise a league table showing that some subjects had higher demands regarding critical evaluation than others. These concerns were acknowledged and fears allayed in giving further explanation of the rationale for the research. The personal approach taken was beneficial to securing agreement to participate and the good will of participants was also evident in their agreement to participate in a follow up meeting once the initial analysis was complete.

The task was designed to elicit what the teachers would expect by way of critical thinking skills and focus from high ability students in their subjects. This involved a hypothetical exercise in which they were asked to consider the kinds of things they would expect a student in their subject to comment on if they were asked to write a critical evaluation of the article supplied. They were not informed that the texts were taken from Critical Thinking papers so as to minimise possible 'second guessing' of what the researcher might be looking for and the intention to compare responses to Critical Thinking assessment criteria and guidelines was not revealed until the follow up meeting. In this way it was hoped to capture a more authentic representation of the working knowledge and expectations of the participants regarding what constitutes critical evaluation in their fields. The benefits of this to validity were evident in the follow up meeting when a participant declared that she would have approached the task differently had she known the Critical Thinking marking criteria in advance.

Two levels of analysis were used. Firstly the responses were trawled for commonalities and differences in the type of evaluative focus taken. This was guided by a desire to reflect what each participant saw as relevant criteria for critical evaluation. In drawing up categories of response, this was inevitably influenced by the researcher's familiarity with forms of evaluation expected in Critical Thinking. The second approach was to compare the points raised in participant responses with the points expected in the Critical Thinking mark schemes for the relevant papers. It should be noted that unlike the open-ended response invited, the tasks in the Critical Thinking exams were narrower in focus, either in referring to sections of text or in prompting particular types of evaluation such as the 'identification of flaws'.

Commentary

The participants were invited to respond either electronically or in writing on an open template (Appendix 5). Half of the responses were received in each format. Participants organised their responses to the open task differently. In two cases (Media Studies and ICT) all points were expressed in relation to specific paragraph content. A more general response was given by the Sociology specialist and a variation of this with some specific references to the text by the Psychology and Biology specialists. The Art teacher set out a developed argument which contained reference to specific points in the text. All participants made evaluative comments on the arguments and evidence contained in the articles, though in two instances there was more emphasis on presenting a counter argument than on evaluating the text on its own terms.

In setting the task it was evident that two levels of hypothetical reasoning were required of the participants: first they had to envisage the task being asked of their students and secondly they had to imagine what they would expect to find in responses from high ability learners in their subjects. Two participants specifically pointed out that the task was *not* akin to forms of assessment actually in use in the subject, though both proceeded to note areas where critical evaluation skills might be expected:

> *Currently there are no requirements for AS or A2 students studying IT to critically evaluate a written article…they do however have to write a short essay…We would hope that high ability students would be able to take most of the points of the article and through the breadth of knowledge that they acquire at A level, go through a process of analysis and synthesis making links and being able to discuss the subject matter in an evaluative way…they would be able to make an evaluative comment on almost every paragraph of Jackie Ashley's article.*
>
> *In the Biology A level course this form of literary criticism is not something which students are asked to do. They are asked to read and comment on experimental design, results and conclusion from much shorter passages, tables and graphs and in a very structured (short answer) way and are expected to evaluate the methods and conclusions of others.*

One participant (Sociology specialist) pointed out that her responses had been guided by assessment objectives in the subject and would include "analysis…of the component parts within an holistic understanding of the argument" and "evaluation...assessing how strong or weak the reasoning is". The Art specialist saw a link between the hypothetical task and Critical and Contextual Studies in Art which can be tackled "as a written analysis and critique of art". The other two participants made no explicit reference to the

transferability of the activity to the working contexts of their courses. The following are the main themes that emerged from analysis of the responses.

Credibility

Issues of credibility, bias and vested interests were raised in five of the six responses. This focus was captured succinctly in the Biology teacher's statement that "I would expect students to be able to consider who has written an article in the sense of likely sources of bias (research funded by an interested party for example)". Similarly the ICT teacher would expect students to note "over reliance on web based sources, wikipedia etc and looking at the validity of information found on the net".

The importance of expertise to credibility and the influence of vested interests were encapsulated in the Art teacher's comment that:

> *Germaine Greer offers up a biased view in favour of graffiti art…whatever Greer's qualifications and authority she may possess as a social commentator of the 20/21 century, she is not an art historian; she is merely presenting her views (a non- art educated view) as an article for publication in a popular national newspaper, the purpose of which is to increase circulation and therefore to make money*

Similar points were conveyed more implicitly in the Media teacher's description of a "scare mongering moral panic" evoked by the article and an overall judgement that it leads to biased misrepresentation culminating in "a spurious deliberately provocative conclusion that ignores the rich history of television, not just as entertainment, information and communication but as art". The criteria applied to credibility by the various subject specialists are the same as those expected in OCR AS level Critical Thinking, where such considerations are a key part of the Unit 1 assessment.

In Sociology the teacher indicated that students would need "to consider the format and structure of the document. The use of 'me/I/they/we/you/our' and their purpose. Does this reflect bias?" This was developed through a suggestion that an awareness of multilayered aspects of bias would be expected:

- *Personal (of the author)*
- *Political (Government/Police) – which should also raise questions of power, wealth, social inequalities*
- *Theoretical influences: Functionalist, Marxist, New Right, feminist etc. Collectivism versus individualism*

Students should use “methodological skills [criteria] such as: authenticity, credibility, reliability, validity…to verify the facts”…”to identify sources & types of data used” and “consider hidden agendas”.

Only the first aspect of bias noted by the Sociologist is dealt with explicitly in the Critical Thinking syllabus and assessment, which focuses on personal forms of bias or credibility and that of document sources. While this might encompass aspects of political or institutional interests, there is no requirement or encouragement to identify deeper matters concerning the framing of issues within particular ideological forms of discourse, such as the varying theoretical perspectives noted by the Sociologist.

Evidence and causality

A range of points were raised about the absence, limitations or misuse of evidence in the sources supplied. The Biology teacher stated that students would be “expected to distinguish wild speculation from established research”. In Psychology, the teacher would expect students “to focus on the research process and research methods used e.g. in para 5 Sloboda’s research is based on a correlation and correlations don’t show cause and effect, so there was likely another variable that caused both”. The Media Studies teacher noted an apparent inconsistency in the attribution of causality in an article in which TV is blamed for violence yet is said not to have led to increased intelligence. The Art teacher noted reliance on sweeping generalisation based on prejudiced preconception in the claim that ‘most aerosol art, like most other art (?), is feeble and bad’. An equivalent focus on issues of representativeness, generalisation and causality is central to the attention to evidence across units of the A level in Critical Thinking.

Reasoning

Two of the responses drew attention to the importance of the logic and power of reasoning in the articles. High ability Sociology students would be expected “to know and understand that…evaluation means assessing how strong or weak the reasoning is…do they [reasons] support the conclusions?” In Biology “they would be expected to recognise very sensationalist claims such as that expressed in the first sentence, and to query the justification for such a comment” and “they are asked to comment on whether conclusions are justified from the evidence provided”. These comments mirror the attention to relevance and significance of reasons and evidence in A level Critical Thinking, which is a fundamental consideration established and assessed in Unit 1. A specific aspect of reasoning identified for assessment in Critical Thinking is the relevance and effectiveness of analogies used to support an argument. The Art teacher noted the lack of evidence supporting the comparator used in Germaine Greer’s analogy “Where is the proof for the comment that follows the oft-quoted ‘stat’ (‘fear of crime is already way

out of proportion to the actual incidence of crime') that the 'loathing of graffiti must be equally if not more irrational?'". The teacher identified that there is no logical reason why one should follow the pattern of the other.

Definition of terms

Three of the responses raised matters of clarity and precision in the definition of terms and in the operationalisation of concepts. In the context of discussing a writer's claim that advances in bio-technology will mean the human species will no longer exist, Biology students would be expected to "discuss the definition of a species" and more generally students "may identify aspects of the language which are not used at A level e.g. 'Darwinian' evolution (prefix not normally required), 'creatures' (the biological term is organisms)." In an article which conflates 'high intelligence' with 'genius', Psychology students would be expected to raise the question "How do we measure intelligence? (validity?)". The Art teacher problematised the definition of 'artist'. Such issues of ambiguity and vagueness of terms are also a focus in the Critical Thinking course.

Knowledge context

All of the elements noted above correspond to syllabus and assessment content in Critical Thinking A level, though limitations concerning the analysis of 'bias' have been noted. There is one further significant aspect of the responses which demonstrates something *more* is required to ensure effective critical evaluation within the academic disciplines.

Every participant made reference to the importance of wider subject knowledge in contextualising critical engagement with the argument presented in the source material. This was variously described in terms of specific information, interpretations to draw upon to enhance the critical discussion, or in terms of thematic or theoretical issues, perspectives and debates.

The A level ICT specialist responded to the task by mapping specific elements from the text about the impact of ICT on brain functioning against knowledge expected from the ICT course. For example, in discussing an argument concerning books versus pictures in paragraph 6, students would be expected to draw upon knowledge of developments such as e-readers like the Amazon Kindle; in relation to claims about icons (paragraph 3), they would draw on knowledge of "Graphical User Interfaces (GUI) – Windows, Icons, Menus, Pointers (WIMP)". This extends to more theoretical knowledge, "Comparing traditional learning methods and constructivism: Vygotsky and Zones of proximal development in blended learning environments" and elsewhere of "Human processing and the information model – Paradigm shifts in rapidly changing technologies". Also a historical

awareness is expected, “modern technological history and its rapid development” and “the slow moving nature of law versus advances in technology”.

To some extent this participant’s approach appears to view a task asking for critical evaluation to be a vehicle for demonstrating knowledge, and that this is what would be valued highly in assessment. A similar impression was created in the Sociology teacher’s statement that “I would expect to see a synoptic application of their sociological knowledge within a sustained evaluative answer”. However it was also suggested that high ability students would recognise the “characteristics of an argument [as to be] In general to persuade the reader. (In Sociology these would be linked to theoretical explanations)”. The implication here is that a sociological argument will be more effective and powerful when it is set in the context of theory. The Biology teacher also placed emphasis on students demonstrating their knowledge:

> *This piece refers to a number of aspects of biology and of biotechnology which are studied on the course, such as evolution, cancer, genetic modification and stem cells. I would therefore expect them to explain what they already know about these processes…*

This is not merely for the sake of displaying knowledge as the respondent went on to indicate that this would enable an informed judgement to be made about the claims in the material

> *…and to evaluate whether it seems likely that such technologies will enable the developments outlined in the passage*.

The Psychology teacher would expect students to discuss the content of the article considered in the light of key issues and debates encountered on their Psychology course, notably in terms of the nature/nurture debate and by recognising the labelling process that can be pursuant upon notions of naturally determined attributes. It was noted that the article “suggests that the environment is stronger than the individual” and so invites discussion in terms of the “individual versus situational” debate in Social Psychology and the issue of “determinism versus free will”. Students would be expected to recognise strengths in the writer’s claim that there is “no guarantee that a brilliant child will make a brilliant adult” by suggesting that “life events (e.g. parents divorce) could alter that (extraneous variables)”.

Much of the response from the Media Studies teacher involved disputing the accuracy of claims made in the text about the detrimental effects of television. This included a suggestion that students should offer a counter assertion that “even young audiences have the ability to distinguish between realistic and unrealistic portrayals of violence on

television" and in response to a presumed negative effect of negative news, recognition that alternative interpretations are possible: "negative views can be re-assuring given that it is always happening to someone else" and "news programmes usually end with positive messages". These points suggest the importance of an *informed* assessment which recognises subtlety/uncertainty of interpretation acquired through subject knowledge and awareness. Subject knowledge also involves bringing a conceptual understanding to the critique as in the teacher's reference to a "scare mongering moral panic" in the article; this can lead to the development of the critique, for instance in comparing the moral panic to those more recently expressed against internet or videogames. It can also point up alternative possibilities, so rather than television viewing encouraging passivity, "quick cutting and changes in plot" can create more active viewers.

The Art teacher teaches A level Critical and Contextual Studies in Art & Design. There was an emphasis on the knowledge context as central to the critical process throughout the response:

> *What I am looking for from a high achieving student is that when discussing a piece/artist/movement is that they are absolutely placed within context i.e. world events, politics, discoveries, wars, treaties, mental state, materials, fashions etc…furthermore, links with other works/artist/movements…are recognised and explored.*

In relation to the article about how we perceive and respond to graffiti, the teacher expected students to "make the following observations"

> *There should be further discussion as to whether or not Banksy, who solely uses stencils when producing his work on other people's properties, is to be considered an 'artist' or 'vandal'. Comparisons with Lascaux and West Arnham Land are relevant but should be put into context…the art (freehand, not stencilled) is on sacred land and/or has been completed within a sacred context…The idea that Banksy is a 'political graffiti artist' bears little weight when one considers his cannon of work and not just a selected few and to name him as such belittles the work of politicos and/or artists who have worked with a true conscience (e.g. Paul Delaroche, David, Otto Dix, Picasso etc)*

This is a powerful illustration of the importance of specialist knowledge in the production of an effective critique. Without this knowledge the basis for assessment of the issue is far more superficial. The title of this course unit is instructive with its juxtaposition of 'critical' with 'context' and aspects of religious, historical and political contexts are drawn upon. Students would be expected to criticise the article because of the author's lack of contextual knowledge: "by comparing artwork from pre-history and Banksy, Greer

displays her lack of art knowledge" and she relies on a vacuous appeal to history "to legitimise this particular form of vandalism". The respondent makes clear that critical evaluation is intimately bound up with effective selection and deployment of relevant subject knowledge; it is essential to recognising the appeal to history as spurious and irrelevant and therefore flawed. The teacher noted in conclusion that

> *Art should always be viewed in context. Should art commentary - in particular that designed for mass consumption - be left to those who have little or no knowledge of the subject but rather a dangerous ability and potential to mobilise public opinion?*

The implication of this rhetorical question is that evaluative judgements require appropriate knowledge of the specialist field if they are to be credible and effective. It is the clearest example of a position which concurs with the views of McPeck and Bailin *et al.* that critical thinking can only be fully realised in the context of specific subjects or fields. The examples cited across subjects demonstrate the importance of subject knowledge to providing an informed and accurate assessment and suggest that generic critical thinking skills of the type promoted in A level Critical Thinking are not sufficient to guarantee the depth and rigour of critical evaluation expected in A level subjects. The significance of this to the epistemological and pedagogical issues surrounding the debate about generic or field specific critical thinking is explored in the discussion chapter.

Comparison with Critical Thinking mark schemes

While there is a general compatibility between the areas of evaluative focus mentioned in the teacher responses and the content and assessment tasks in A level Critical Thinking, a comparison was also made directly against the mark schemes available for the papers used (Appendix 6). The level of detail provided by the subject specialists was variable as was the extent of the match with evaluation points identified as credit worthy in the Critical Thinking mark schemes. This ranged from a high level of equivalence on the Art History piece to no direct matches with the evaluation points for the Biology themed paper, though the issues of definition and evidence raised by the Biologist fall clearly in the domain of critical thinking. In the formal Critical Thinking mark schemes there were more varied and numerous references to flaws in reasoning, with mention of straw men, contradiction, false dichotomy, confusion of necessary and sufficient conditions, as well as the appeals and definitional issues picked up by the respondents. There appears to be greater emphasis on logical relations in the Critical Thinking mark scheme to add to the focus on evidence (causality, representativeness, credibility) found in the teacher responses. It is possible that these features of explicit critical thinking teaching led students in their questionnaire responses to stress the need for specialist teaching of critical thinking. However, the omissions relative to the mark schemes can be seen as

simply more of the same kinds of concern, a purely quantitative difference, rather than a qualitative difference in the type of critical focus taken. In Lipman's terms "inept reasoning violates only a relatively small number of value-principles: *precision, consistency, relevance, acceptability,* and *sufficiency*" (2003: 233, original italics). Lipman maps a vast array of flaws and fallacies against these value-principles (pp. 236-7) and there are examples of all types evident across the teachers' responses (Table 5.4). It should also be emphasised that there is no place for crediting use of specialist knowledge in the Critical Thinking mark schemes as this would bias student assessment in favour of those with good knowledge of the related subjects. The consequence of this is that the richness of evaluation suggested by the subject specialists is excluded from the working assessment practices and therefore the *de facto* definition of what counts as critical thinking.

Table 5.4 Match of teachers' responses to Lipman's value principles

Value principle	Feature of flawed logic	Examples cited
precision	definition	Biology; Art; Psychology
consistency	contradiction	Media; Psychology
relevance	appeals match of reasons to conclusion	Art; Media Biology; Sociology
acceptability	faulty analogy credibility	Art Art; Biology; ICT; Media; Sociology
sufficiency	correlation/cause confusion overgeneralising	Psychology Art

Source: List of principles from Lipman (2003: 236-7)

5.4 Comparison of participant views and experiences with expert conceptions

The teacher and student samples were from different institutions and were involved in different tasks and so cannot be compared directly in terms of perspectives on the same research questions or learning experiences. Nonetheless there is value in noting areas of convergence and divergence in the views expressed. The follow up discussion with teachers included a focus on the differences that emerged. Both sets of sample responses are interpreted in the context of expert accounts considered in the thesis as illustrative of theory espoused and policy characterised.

5.4.1 Student definitions of the scope and meaning of critical thinking

As might be expected the perceptions of students in the A level Critical Thinking sample closely match the concept as defined by the Cambridge Assessment Group which underpins the syllabus followed. There is a focus on reasoning and evidence, and an emphasis on skills of argument analysis and evaluation. However, there are a number of features of student responses which embellish this core concept. There is a sense that critical thinking involves a proactive as well as a reactive skill set as it nurtures skills in presenting and developing argument. There is recognition that critical thinking entails creative thinking in terms of hypothesising explanations, solutions and consequences. There is an emphasis on dispositions associated with critical thinking, in particular adopting a healthy scepticism when faced with claims encountered in other subjects and in lived experience. It is recognised that these dispositions affect all kinds of interaction in the world and have been internalised, creating a condition akin to critical being, described by Barnett as both "a higher order state of mind and … a higher order state of human being" (1997: 69). The importance of a critical thinking disposition to the operation of democracy is recognised and articulated in student comments, in keeping with the beliefs of the exponents of the critical thinking movement from Dewey onwards, and with the process driven educational ideology advocated by Kelly (2004). On a cautionary note, it is not certain that studying Critical Thinking creates these dispositions as it may be that those attracted to the subject have a predilection for this kind of enquiring and questioning attitude, whilst this in turn might be linked to social background characteristics such as social class and ethnicity; though, at the very least, it would seem to validate and support learners' confidence in their critical being.

5.4.2 Teacher (subject specialist) conceptions of critical thinking

There are some differences in student and teacher responses in the emphasis given to evidence or reasoning elements of a critical focus, though aspects of each are mentioned by both. However, there is a significant difference in the scoping of what constitutes critical thinking, with teacher responses adding consideration of subject context to the general thinking skills referred to in the students' comments. When asked to define critical thinking the students gave accounts which reflect the 'orthodoxy' of the critical thinking movement. It is not surprising that these responses omit reference to contextual knowledge when this has been immaterial or taken for granted in the *modus operandi* of their Critical Thinking course. It should be noted that the teacher sample were not asked the same questions, and that their view of critical thinking is inferred more indirectly from answers to a question asking them to identify how they would expect students to approach critical evaluation in their subjects. Their responses, like those of the students, were grounded in their own familiar operating contexts. Their starting points were subject expectations in which relevant contextual knowledge is seen as both integral and indispensable to critical evaluation, whereas the majority of students felt that the critical thinking skills they had acquired were for the most part sufficient to produce effective critical evaluation. Despite the differences in emphasis, there was a convergence in student and teacher responses as on the one hand subject teachers identified a range of general thinking skills they would expect to find in critical evaluation; while on the other hand students acknowledged the need for relevant knowledge when asked to consider its importance. This reveals both the relevance of and limitations to both a domain specific *and* a generic model of critical thinking in the curriculum and is suggestive of the desirability of a combined approach as advocated by Bailin *et al*. (1999b: 299). This axis is a key one in addressing pedagogical and theoretical issues raised in the thesis and is explored further in the discussion and conclusion chapters.

5.4.3 Epistemology

The epistemological position underlying students' responses is that of the critical thinking movement. This epistemological position is taken for granted and students show no awareness of assumptions about the nature of the concept of knowledge that lies behind their analysis and evaluation of argument, for instance about the conditions for certainty or sufficiency. This is not surprising as the critical thinking they experience, and the syllabus behind it, is not taught in a context that would ground it in the philosophy of knowledge. Comments made by two learners about the 'factual' basis of subjects such as Physics placing it outside the scope of critical thinking suggest a nascent, if naïve, epistemological sensibility as this marks natural science off as an absolutist and positivist

domain, as opposed to the more tentative status of knowledge in other areas such as the social sciences, humanities and arts. It is in applying critical thinking to these and in their approach to life that the students are effectively aligned with the epistemological position of Popper and fallibilism, summed up by Barnett (1997: 23):

> *Through critical and rigorous examination of each theory…, through a process of conjecture and refutation, we can approach nearer the truth – so gaining for our theories greater verisimilitude – even if we cannot ever entirely reach it.*

This is the epistemological paradigm for Dewey and the critical thinking movement, rather than the absolutist position of positivists at one extreme or the relativist one of postmodernism at the other. The emphasis on standards of reasoning and evidence in the critical thinking movement and in the critical thinking exercised by the learners is at odds with a relativist position in which standards are reduced to differences and disagreements of beliefs: "Postmodernism denies that there are secure critical standards of any kind" (Barnett 1997: 23-24). In the trial iteration of the NGT activity, a quote from Moon claiming a relativist position as the height of critical thinking proved to be a considerable stumbling block for the student respondents as it required too much by way of explanation of the whole territory of conflicting paradigms of knowledge to be practicable in the response activity, and was removed from the finished version. Given that this position "implicitly repudiates the notion of criticism" (Barnett 1997: 24) it is remote from the experience of these learners.

Insofar as the teachers endorse the relevance of universal critical thinking skills as a test of the warranty for propositions and beliefs in their subjects, they appear to subscribe to a similar epistemological position to that which underpins the outlook of Critical Thinking students. However, the evidence for this is less clearcut as the teacher activity did not give the same opportunity to explore the foundations of their conception of critical thinking: the task itself was couched in terms of 'critical evaluation' rather than critical thinking, though the latter phraseology was used (unsolicited) by an ICT teacher in the follow up discussion. The general concern with accuracy and objectivity in the gathering of evidence across subject specialists matches a positivist or fallibilist orientation. The uncertainty of Biology and ICT teachers about the applicability of the activity posed, conveyed a sense that their subjects are concerned with transmitting 'facts' and are not open to critical scrutiny, except under narrowly defined criteria applied to evidence, or in more discursive consideration of subject related 'issues'. This suggests clear adherence to positivist or falllibilist epistemology, and also a distinction being made between knowledge and belief, albeit with similar criteria for warranty being applied such as objectivity and precision in use of terms. The arts and social science participants gave equivalent accounts of critical evaluation skills they would expect and added recognition

of the social relativity of knowledge and judgements, notably in the Sociologist's reference to different theoretical perspectives. In this there appear to be echoes of postmodernist or social constructionist epistemology, while the emphasis of all on the need for contextualising by and in the knowledge community matches a social realist approach. A number of possible conclusions arise from this: that there is insufficient material to arrive at a valid judgement on the epistemological assumptions of the teachers; that there is a degree of similarity and also of difference in the stances taken within particular disciplines; that in some cases there is epistemological confusion as multiple stances are taken or alternatively that the epistemological positions themselves are not mutually exclusive in terms of the practices expected and adopted.

5.4.4 Generic skills, transfer and subject variations

In keeping with the prevailing orthodoxy in the informal logic movement, students experience and see critical thinking as involving general skills of reasoning and evaluation that are transferable across situations and domains. Student responses exhibited a confidence in, and gave examples of, their ability to apply their critical thinking skills in other subjects. Students do not regard critical thinking as they experience it as denuded of knowledge as they believe they have sufficient to apply their analysis and evaluation skills to the material provided, which might explain the apparent inability to grasp the significance of the question asked about whether it is sufficient to evaluate effectively in their other subjects. They perceive critical thinking skills as valuable and relevant to their other studies and believe that A level teachers expect them to be applied. This was confirmed in the teacher sample as the abilities expected of high performing students across a range of disciplines correspond closely to those included in A level Critical Thinking, *viz.* issues of credibility, causality, definition, representativeness and reasoning. This appears to support Smith's claim that there is "a considerable amount of general task related knowledge that applies over multiple domains" (2002: 674). However, students also reported that these skills are not taught and developed in other subjects, leading to a potential gulf between teachers' expectations and students' performance. The overall commonality of response may be taken to provide endorsement for an A level Critical Thinking which develops such skills on a generic basis, especially as student responses show recognition of its transferability. On the other hand it might be used as evidence that a dedicated Critical Thinking course is not needed if we can assume that teachers in other subjects facilitate its development anyway, however implicitly, thus confirming Young's view that "it is unnecessary in a conceptually strong curriculum" (2009a: 2).

Most students felt that critical thinking skills were not developed in their other subjects, which appears to conflict with Young's view and with teachers' expectations that they need to be applied to do well. This apparent discrepancy between teacher and student views begs the question of whether teachers actively teach the critical skills they associate with high ability students or simply assume that they will be able to use them. A comment from the ICT teacher about the notional critical evaluation task is informative in this respect: "the students, while having the cognitive tools to achieve this, would need careful guidance and coaching in writing critical evaluation". This was couched in hypothetical terms, which seems to suggest that the skills are not explicitly addressed currently in the normal course of the teacher's practice. However, in the follow up discussion this teacher suggested that teaching on most units did not require such skills. Otherwise there was a clear view amongst the teachers that such skills were encouraged and taught from the beginning of their courses, both in explicit skills or evaluation sessions and on an ongoing basis.

The students' perceptions may in part be attributable to a lack of visibility of the recognisable indicators of a critical thinking approach in their other subjects, with limited use of critical thinking nomenclature such as flaw labels. As suggested in the reference to Lipman's value principles, this may reflect a surface judgement rather than a real absence of critical thinking at a deeper level. This point was also raised by the teachers who felt that "they might be doing it without the language [of Critical Thinking] being used to articulate it" (ICT teacher) and therefore it may be a matter of how things are labelled that might account for the apparent lack of attention to critical thinking in other subjects, for example the effects of bias on the reliability of a source might be discussed without labelling this a matter of credibility as in Critical Thinking. Nonetheless this 'perception gap' may be highly significant in relation to students' grasp of and ability to apply high level critical evaluation skills in their other subjects and therefore on their achievement potential. As Smith has concluded "everything known about transfer…indicates that knowledge of thinking will only transfer if it is taught explicitly and with transfer firmly in mind" (2002: 676). Whilst the referent for 'transfer' is normally application to different fields or domains (Johnston *et al*. 2011), the lack of transparently articulated principles or standards could impede capacity to repeat apply critical analysis even within a particular field, thus limiting "near transfer" (Perkins, cited in Johnston *et al*. 2011: 44). As one of the teacher participants commented "in subjects there needs to be more explicit reference to these skills under 'evaluation' …we would be able to measure [assess] it with more precision" (Sociology teacher). In Smith's terms this represents a call for more "procedural specificity needed to make [skills] more powerful" (2002: 668).

Almost without exception students felt that critical thinking skills were relevant to all their courses of study and that would appear to be confirmed by the expectations of the

teachers regarding criteria for evaluating material on a subject basis. In the student responses, a small number of individuals did not believe critical thinking was relevant to other subjects, with Sport Studies, Art and Science mentioned. The responses of the Art and Biology teachers in the sample suggest it is just as applicable in these areas as in the humanities or social sciences, and this is reinforced by the extensive reference to critical evaluation in the Biology assessment objectives and performance descriptors (Appendix 7). However, it is noteworthy that the two teacher participants who were initially sceptical of the applicability of a task involving critical evaluation of a text were in ICT and Biology. As with the student exception responses, this is perhaps indicative of a default perception that critical thinking is not part of the culture of learning associated with science and technology subjects. This is despite the overt reference to critical evaluation in the relevant syllabi. In the follow up meeting the ICT teacher pointed out that the kind of critical analysis considered is really only expected and applicable to a course unit on social implications of technology, not to the other technically based ones in A level ICT. It was also suggested that ICT students following subjects which entailed more frequent analysis and development of extensive writing, such as Psychology and Sociology, would typically fare better with evaluative analysis than others who took more practically based subjects such as Art.

5.5 Chapter summary

The chapter has placed the introduction of A level Critical Thinking into policy and conceptual context. With an emphasis on critical reasoning skills the A level syllabi reflect the approach to critical thinking derived from the informal logic movement. The recent Cambridge Assessment group meeting of experts has confirmed and encapsulated this focus and origin. In emphasizing the transferability of skills and dispositions developed, claims are made regarding the value of critical thinking to wider learning, to preparation for HE and employment and for personal and social development. While it shares some characteristics with the genericism Young associates with an evacuation of knowledge from the curriculum, in other respects it serves to support critical engagement with knowledge and itself constitutes an emerging field of knowledge. Therefore it has been suggested that it could be interpreted as functional in either a technical instrumentalist or neo-conservative traditionalist approach to the curriculum, though its compatibility with the kind of knowledge led curriculum advocated by Young remains to be established.

Sections 5.3 and 5.4 discussed primary research findings and their relationship to conceptual, theoretical and policy issues identified in Chapters 2 and 3. This has demonstrated the synergy between the theory espoused of the informal logic movement,

policy enacted in the implementation of A level Critical Thinking and policy experienced in the views of student participants. However, whilst acknowledging the value of their studies in Critical Thinking, students also identified limitations to its effectiveness in relation to the critical evaluation expected in their other subjects. The teacher sample responses endorsed the value of general reasoning skills such as those associated with Critical Thinking, but also conveyed the importance of discipline specific contextual factors in executing effective evaluations. A number of points were raised about the epistemological assumptions and form of critical thinking expected in the context of different subject cultures and indeed whether it has a place at all. These findings are of significance in considering the field centred concepts of knowledge held by Young and the social realists and of critical thinking held by the alternative school of McPeck and others. Issues of significance to pedagogy were also noted, raising questions about whether critical thinking skills should be taught to all A level (and other) PCET learners, and if so whether this would be best achieved through a discrete bolt on course like AS/A Critical Thinking or through an integrated approach underpinned by thoroughgoing subject based professional development. These conceptual and pedagogical concerns are explored further in the next discussion chapter along with the significance of the research findings to curriculum theory.

Chapter 6: Discussion

6.1 Introduction

The study's exploration of critical thinking has been multidimensional, taking in aspects of theory, policy and practice. It has been approached through a synthesis and critique of discourses drawn from philosophy, sociology, education policy and education theory, combined with the practitioner perspectives of a sample of students and teachers. The insights provided by the primary research are combined with reference to cross disciplinary materials in a chapter which addresses the research questions in order to draw out key issues in the interest of conceptual and theoretical illumination.

6.2 Response to research questions

Research question 1: What is the concept of critical thinking that underpins its realization as an A level?

How does it relate to variations in the way the term is used in academic literature?

The model of critical thinking adopted as an A level by the leading awarding body is based on the definition, criteria and practices expected by the Cambridge Assessment group and approved by the QCA (section 5.2.2). This is based on a generic, skills based approach and derives from the work of writers in the informal logic movement such as Ennis and Fisher. The emphasis is on application of general reasoning skills in the analysis of argument, seen as the core focus by student respondents. Also, in keeping with the aspirations of the informal logic movement, it is evident from their accounts that studying A level Critical Thinking contributes significantly to cultivation of critical dispositions. There are some features of the concept of critical thinking in the informal logic movement, as derived from Dewey, that appear to be underdeveloped or ignored in the A level syllabus, whilst receiving support in students' responses to statements about the relationship between critical thinking and creative thinking and problem solving. There is no acknowledgement of the alternative field-specific conception of critical thinking associated with Toulmin and McPeck in the discourse pertaining to A level Critical Thinking, including syllabus content and reading lists; however there was some debate amongst student respondents concerning the capacity of general critical thinking skills to provide adequate evaluation in particular subjects, thus suggesting an emerging awareness of issues relating to the field specific location of criteria as advocated by Toulmin and McPeck.

What is the conception of knowledge reflected and represented?

There are echoes of rationalism in an approach which abstracts processes of logic from knowledge contexts, though the preoccupation of formal logic with closed systems of justification is not found. Instead this is the critical thinking of the informal logic movement which "view[s] rational thinking as separated from social and intellectual contextual knowledge. They offer general intellectual rules which can be transferred between disciplines" (Johnston *et al*. 2011: 24). This model of critical thinking rests on an epistemological position which assumes that a universal system of warranty and validation of knowledge can be applied. Most typically its adherents subscribe to fallibilist epistemology: its function to provide a means of improving the plausibility and grounds for claims, whilst recognising that this does not lead to absolute certainties in knowledge (Scriven 1976, Siegel 1988, A. Fisher 2001). It has been shown that there is an epistemological unity between this dominant concept of critical thinking in *theory espoused*; *policy espoused* in government promotion of generic, transferable critical thinking skills; *policy enacted* in the A level form of critical thinking; and in the working definitions and knowledge in the *policy experienced* of A level Critical Thinking learners (section 5.3). However, in detaching the principles of rational assessment from the social contexts in which knowledge is produced there is a reliance on universal procedures and a reified concept of knowledge which has been rejected by the social realist school (Young 2008, Maton and Moore 2010) and by proponents of field dependent critical thinking, who argue that logical procedures are subject specific (Toulmin 2003, McPeck 1981).

What are the pedagogical implications?

A generic conception of critical thinking might be expected to find expression through some form of integration across the curriculum. Whilst this is the case with PLTS across types of vocational curriculum, it is not the case for A level Critical Thinking. It is a matter of institutional choice whether or not this is offered to students, and if it is it is usually optional for students to take it as part of their programme (Black 2009a). Its existence as an A level owes much to the efforts of a particular community of experts such as A.Fisher, Van den Brink Budgen and Butterworth in championing its value as a uniquely skills based A level offering enhancement to learners both at A level and beyond into higher education. It is underpinned by a belief that the skills it engenders will not be adequately developed if left embedded in the teaching of other subjects and therefore warrants a discrete course of study. As a standalone A level, Critical Thinking appears to sit at one extreme of a continuum of pedagogical models ranging from the other extreme of fully embedded to totally discrete delivery and assessment. However, there are misplaced assumptions in this characterisation: although A level Critical Thinking is a distinct

subject, it is studied as part of a wider A level programme and is thus embedded in a wider knowledge context for each learner. A noteworthy outcome of the primary research is that students appear to actively make links and connections between critical thinking and their other subjects.

It has been suggested that covert forms of critical thinking may be expected in the development of higher level critical evaluation skills in other A level subjects. However, student comments suggest that there is mystique rather than transparency surrounding just what the highly rewarded skills entail, as encapsulated in the statement of a Critical Thinking student that critical evaluation is expected in other subjects without clear specification of what this requires. Teachers also noted this lack of transparency and specificity and their own comments suggest the desirability of a hybrid concept of critical thinking which encompasses generally applicable skills alongside subject specific knowledge contextualising. In Barnett's terms, this would be an amalgam of *critical thinking* and *critical thought* (1997: 70-72). The latter invokes the alternative 'discipline specific' concept of critical thinking associated with Toulmin and McPeck and which is predicated upon a social constructionist epistemology. However, in valuing both the generic and the specific, this position is most exactly matched with that of Bailin *et al.* (1999b).

Research question 2: How can the significance of critical thinking be interpreted in curriculum theory?

What is the interpretation offered in progressive liberal and social realist theories?

The thesis has involved application and juxtaposition of two main curriculum theories to provide interpretation of the significance of critical thinking (Young 2008 and Furedi 2009 contrasted with Kelly 2004). A distinctive contribution of the thesis is to lay bare the epistemological assumptions of these approaches and to indicate how they have shaped the way in which critical thinking has been conceived. For Young and Furedi, critical thinking is associated with policy trends driven by a technical instrumentalist ideology and which displace a knowledge focussed curriculum. For Kelly recent policy is characterized by a labour market emphasis which reflects an 'aims and objectives' approach that supplements the established knowledge based curriculum. In *content*, both analyses are critical of entrenched traditional models of knowledge and learning; while in *form,* they both describe broad ideological positions which they claim underpin educational policy and practice in its extant and emerging guises. However, the depictions depart markedly from each other in relation to the desirability of a knowledge driven curriculum and with regard to the role of critical thinking. Kelly rejects the 'product' and 'performance' models of education that he claims have dominated recent policy, preferring a vision of a more personalised and process based curriculum. This seems well matched to the kind of

PLTS programme associated with Diploma courses rather than an A level which takes its place in a more traditional curriculum structure. However, despite this association, it could be expected that Kelly would encourage and endorse a role for an A level Critical Thinking that learners recognise as providing a basis for developing rationality and personal competencies and confidence in areas such as decision making and citizenship. Young and Furedi, on the other hand, are critical of the role played by critical thinking as part of a generic skills based approach to the curriculum, as this is seen as antithetical to worthwhile education founded on knowledge. Both approaches are sceptical of subjects that are justified in instrumental terms such as the claims that Critical Thinking A level enhances performance in other subjects and progression opportunities.

Kelly's rejection of a knowledge based curriculum assumes that this rests on an absolutist epistemology in which knowledge is treated as externally given truth. This is contrasted with alternative epistemologies which point to the social relativity of knowledge; however, Kelly portrays these – fallibilism, social constructionism/constructivism and postmodernism - as seamless variations on a theme. Kelly thus restricts the epistemological choice to absolutism or relativism and there is no room for a realist alternative. Kelly endorses post modern relativism but, as the social realists have pointed out, this leads to the sterility of critique on critique and undermines the logical grounds for any appraisal of knowledge claims, thus rendering any critical thinking endeavour pointless. In Young there is recognition of commonality in the concepts of truth guiding positivism and Popper's fallibilism, which are contrasted against the relativist position of social constructivists and postmodernists, and he posits social realism as an alternative which recognises both the social construction of knowledge and its fallible status. It has been argued, contrary to social realist usage, that constructionism and constructivism should be clearly distinguished as there is a significant epistemological break between them (section 4.2.2). This distinction is fundamental to the critique of Moon's constructivist approach, which relies on a flawed developmental approach to epistemology that results in a questionable equation of relativism with the highest form of critical thinking (section 3.4.2). Instead it is suggested that social constructionism, as distinct from constructivism, is consistent with Young's social realist conception of knowledge and is key to reconciling critical thinking with Young's preferred knowledge based curriculum.

How can Young's social realist analysis be extended and refined to provide a more differentiated analysis?

Young and Furedi's references to critical thinking limit it to a role in the promotion, implementation and maintenance of a technical instrumentalist ideology. It is seen as a form of soft genericism which typifies the de-differentiation that social realists associate

with an evacuation of knowledge in the curriculum. There is some support for this interpretation in the rationale for thinking skills in policy espoused and enacted; however, it can also be seen to serve a neo conservative traditionalist ideology (section 5.2.5) as it is intimately bound up with notions of higher skills needed to master subjects at a level deemed suitable for preparation for university. This was reflected in teacher responses in the primary research that showed critical thinking skills are expected if students are to achieve high grades, and is therefore integral to successful acquisition of and performance in knowledge based subjects.

The critique of thinking skills/critical thinking in Young and Furedi's work is weakened by the undifferentiated and empirically unsubstantiated portrayal of it. The blanket rejection of critical thinking rests on a particular image of what it involves and how it is realised in curriculum practice. A more refined and extended application of Young's realist analysis would recognise the different operating contexts and *modus operandi* of different curriculum expressions of critical thinking such as a discrete A level, embedded PLTS or implicit evaluative skills developed and/or expected within other courses. Linked to, but not automatically aligned with, differences in curriculum content are differences in pedagogical models as critical thinking may be taught as a discrete subject, 'infused' in subject contexts or fully embedded in them. The differentiation also needs to be made in terms of function, as critical thinking can be seen to support the principles of a traditionalist model of the curriculum as well as technical instrumentalism. Finally it should be recognised that there are conceptually and epistemologically distinct ways of conceiving of critical thinking. While the critical thinking 'orthodoxy' of the informal logic movement encompasses its realisation as an A level in the UK curriculum, based on a *field independent* generic skills model, there is a continuing *field specific* tradition which can be traced from Toulmin to McPeck to Bailin *et al.* and contemporary writers such as Johnston *et al*.(section 3.3.5). This tradition shares common antecedents with Young, including Toulmin and Hirst, and it would appear commensurate with the social realist approach to knowledge. Young's conception of socially grounded knowledge is based on the workings of "specialist communities such as subject and professional associations" and "ways of thinking that will differ in different domains" (2009a: 7). Each community of specialists will have its own traditions, protocols, methods, discourse and criteria for truth. In place of an "a-historical view of knowledge and reason" (2008: 87), there are different conditions of knowledge acquisition and production. This depiction of the operation of separate epistemic communities closely matches the idea of field dependent 'situated logic' described by Toulmin.

The need for knowledge of an area if meaningful critical evaluation is to be entered into is evident in examples such as this:

> *Background knowledge in the particular area is a precondition for critical thinking to take place. A person cannot analyse a particular chemical compound of he or she does not know something about chemistry, and without an understanding of certain historical events a person will be unable to evaluate competing theories regarding the causes of World War 1.* (Bailin *et al.* 1999a: 271)

This finds echoes in Young's plea, "how can you have an informed discussion about HIV/AIDS in school or college if your science curriculum does not include the study of viruses and auto-immune systems?" (2009a: 2). As Bailin *et al.* note, "the separation of knowledge and critical thinking is fraught with difficulties" (1999a: 271) and the position is developed by explaining that it is not simply a matter of needing background knowledge in order to apply general critical thinking skills; rather, skilled performance of thinking tasks actually depends on knowledge (including a level of conceptual understanding) and an awareness of the conventions and procedures which govern the application of standards in different subject contexts. Conceived in this way critical thinking adds substance to a social realist account of 'powerful knowledge': critical thinking and knowledge are mutually *dependent* not *exclusive*.

While there is ostensibly no place for critical thinking in Young's social realist approach to the curriculum, the potential for and value of this are evident. Young describes the realist approach as based on a differentiated curriculum in which "the groups which form the basis for the objectivity of knowledge are…'communities of specialists'" (2008: 166). His account equivocates between (i) differentiation as separation between disciplines and (ii) differentiation between the realm of knowledge determiners (specialists/experts) and that of everyday experience and 'knowledge'; and between (i) '*communities* of specialists' as experts in different fields (researchers/teachers) and (ii) 'communities of *specialists*' (researcher's italics) as opposed to non-expert lay population. In the latter variants he stresses the distinction between "context-independent knowledge" and "the everyday context-dependent understandings that we acquire through experience" (p.166). This appears to universalize worthwhile knowledge (*cf.* science) in opposition to common sense knowledge and seems at odds with the first interpretations which emphasize a demarcation of fields, each with its own context defining characteristics such as its language, concepts, research protocols, criteria for warranty, and which would seem to invite forms of 'context-tied' not 'context-free' knowledge (borrowing the descriptors used previously by Bernstein to distinguish restricted from elaborated socio-linguistic codes). The social realist solution to this conundrum is to note the context specific production of knowledge but the emergent quality it assumes in taking on a "context transcending" form and status that supercedes the conditions of its creation (Moore 2007: 32-3).

Whichever reading of Young is taken on the differentiation of knowledge, there is evidence to suggest that critical thinking can play a significant role in the realist curriculum. The discrete, formalised curriculum of A level Critical Thinking is clearly matched to version (ii) as the syllabus is based on expert definitions and introduces a 'language of reasoning' that derives from informal logic, bringing specific meaning to terms such as 'assumption' and 'validity'. Students expressed the view that this is a distinct field best left to specialist teachers. Also responses from subject teachers showed that a similar set of critical thinking criteria informed their expectations regarding evaluation skills essential to their subjects: this also gives support to version (ii), though the depiction of universal critical thinking skills and standards would seem at odds with the differentiation of disciplines indicated in version (i). However the teachers, and to a degree the students, demonstrated the importance of relevant subject based knowledge contextualising if deeper levels of critical discussion are to be achieved. This is an essential additional ingredient for a more fully realised social realist model of critical thinking to take its place in a knowledge driven curriculum.

Research question 3: To what extent do participant views and experiences support the representation of critical thinking in the curriculum theory of Young and Furedi?

How do judgements on the value of critical thinking compare?

In Chapter 5 it was shown that a consistent and striking feature of student responses to the questionnaire and NGT activity was the positive value attributed to critical thinking. This was expressed on a variety of levels, ranging from *personal* confidence in argument and debating skills and adoption of reflective and questioning dispositions; to *academic* competencies and assertiveness such as the ability to critically assess material in other subjects; to the *social* significance of the rational and critical approach encouraged as vital properties of democracy. There is a coherence to this positive outlook which suggests a powerful socialising effect at work in the context in which these students experienced and formed a view of critical thinking. While East College is a recognised 'best practice' institution for Critical Thinking, it can be noted that similar responses were found in the earlier trial at West College. The students' whole hearted emphasis on the value of critical thinking runs directly counter to Young's dismissal of it as "unnecessary in a conceptually strong curriculum" (2009a: 2) and McPeck's of it as "fruitless and sterile" (1981: 81).

It appears that study of Critical Thinking has a potentially powerful effect in its transferability to other domains and contexts. This is in part because the participants had experienced learning under the conditions for effective transfer of learning "when general principles and reasoning processes *are taught in conjunction with* their real life

applications in varied, specific contexts" (Foertsch cited in Johnston *et al.* 2011: 46, original italics). This may help to explain the correlation found between studying Critical Thinking and higher performance on average in other A levels compared to equivalent learners (Black 2009b). In the teacher response activity, a similar skills set to those explicitly identified, addressed, practised and assessed on a Critical Thinking A level course was associated with high student performance across a range of subjects. The reasoning and questioning involved are characteristic of the deep approach to learning that has been linked with successful academic development (Entwistle and Ramsden 1983). The acquisition of transferable skills is complemented by the transformative effect on individuals' self image as the students have internalised values associated with critical thinking. It has become "a disposition that grips the mind in certain circumstances" (Furedi 2004: 1) and they have gained the necessary confidence: "Academic assertiveness is about the thinker's personal confidence, her 'voice' in academia and her ability to process, work with and express critical ideas and action" (Moon 2008: 77). However, belief in this potential for transfer is not the same as demonstrating the ability to do so and is a limitation of the primary research in the current study, which has not included evidence of either impact on the students' performance in other subjects or relevant longitudinal research into the experience of the learners of transition into higher education learning contexts. Similarly this sample from a PCET setting appear *en route* towards developing the criticality Barnett believed higher education professionals and students should aspire to, combining critical attention to knowledge, self and the world (1997: 74), but it is not certain that this ideal state will be reached as the socialisation and learning experienced may not be *sufficient* to impact on the conduct of the learners lives in the symbolically significant ways Barnett admires (p.66) or to reach "profoundly new understandings" (p.93). Nonetheless it fulfils *necessary* conditions for this by fostering both the skills and dispositions required to make this possible.

Given the positive endorsement of the value of critical thinking in student and teacher responses, interesting pedagogical issues are raised. It might be inferred that the associated skills should be taught to all A level students and possibly those on other levels and types of course. Participant comments supported the need for explicit teaching of such skills, which could be through a discrete course like the A level Critical Thinking, or alternatively could be achieved by all subject specialists giving explicit attention to these skills in their teaching (an infusion approach). Whilst this would have some advantages in terms of contextualising, it would require significant investment in staff training and a coherent approach to subject based professional development, be it institutionally, via professional networks or via awarding bodies.

What is suggested about the relationship between critical thinking and the knowledge curriculum?

Young portrays critical thinking as part of a trend to soft genericism which undermines a knowledge based curriculum, while Furedi characterizes it as part of the anti-knowledge pedagogy. It has been argued that this rests on an oversimplified and unsubstantiated vision of critical thinking and that through attention to differentiated forms a more complex picture of its relationship to the knowledge curriculum emerges. While there may be issues concerning the identification and criteria for assessment of thinking skills in the PLTS form closest to the soft genericism Young describes, these form a minor part of the whole curriculum and are seen to support the acquisition and manipulation of knowledge in such vocational programmes. As a discrete subject at A level it complements engagement with knowledge in other subjects as it is also bound up in a deeper understanding and level of ability in knowledge areas (subjects) as shown by the expectations of staff, syllabi and teachers.

The object of learning in A level Critical Thinking may be seen primarily in terms of acquisition of techniques for argument analysis and evaluation and is thus directed towards *procedural* knowledge, whereas, for example, study about epistemology in the compulsory Theory of Knowledge element of the International Baccalaureate is a form of *propositional* knowledge. There is an assumption in Young's work that education should be concerned with the latter. Young suggests that thinking and learning must be *about* something and cannot form the basis of the curriculum if abstracted from a knowledge context (2012a: 149). According to Young what separates worthwhile educational knowledge from everyday knowledge is its conceptual character and concepts are organised and 'bundled' in subject clusters, therefore a knowledge led curriculum means a subject led curriculum rather than a learner led approach (2010b: 21,25). However it could be argued that instances of procedural knowledge can also be specialist and warrant inclusion in a curriculum differentiated from everyday experience, understanding and capabilities, and thus be consistent with the realist position. In any case critical thinking itself comprises a combination of procedural and propositional knowledge (Siegel 1988: 44-5). Lipman has defended free standing courses on the grounds that critical thinking is derived from philosophy and logic, "normative disciplines concerned with specifying what excellence in thinking ought to be" (2003: 44). In arguing that knowledge by definition entails critical thinking, McPeck (1981) appears to lend support to Young's position by assuming that it is subsumed within it. However, logical entailment does not guarantee that it is realised in practice, though it does imply it is a necessary corollary. Deliberate and active application of critical thinking is a prerequisite for researchers and knowledge creators and for teachers and students in the process of knowledge

transmission. This entailment therefore supports rather than negates the importance of critical thinking to knowledge.

6.3 Chapter summary

From the discussion of the research questions in this chapter it can be seen that the thesis has developed an interpretation of the significance of critical thinking to the curriculum through conceptual, theoretical and pedagogical analysis. This has been enhanced by use of illustrative material drawn from the primary research undertaken on A level Critical Thinking. The most fruitful line of enquiry has considered the application of the social realist view of the curriculum as a framework for interpreting the policy and practice of critical thinking. Contrary to Young and Furedi's dismissal of critical thinking, it has been shown that A level Critical Thinking is assessable, meaningful and valued by students, at least in a situation where it is taught effectively and well. As such the case study provided a 'negative instance' which contradicts the generalized depiction of critical thinking in the curriculum theory of Young and Furedi. It matches Seale *et al.'s* example of a case in which "the researcher took the findings of another [theorist] as a set of ideas to be tested in a related setting, finding deviant cases which led to modification of the original [theorist's] conceptual scheme" (1999: 80). The approach taken involved application of fallibilistic analytic strategy and rather than a simple rejection of Young and Furedi's theory, evidence from the primary research informed a proposed modification and development of it. In keeping with the realist advocacy of differentiation in the curriculum, what is suggested is differentiation in the analysis of critical thinking.

Chapter 7: Conclusions and recommendations

7.1 Introduction

This chapter identifies the main contributions of the thesis to the development of conceptual and theoretical analysis of critical thinking. It sets out implications for pedagogy and also for broader curriculum policy. A review of the research methodology undertaken is included and there is recognition of the limitations of the study together with suggestions for further research. In conclusion a summative statement synthesizes the conceptual, theoretical and pedagogical contribution of the thesis and offers a platform for future developments in both theory and practice.

7.2 Conclusions

7.2.1 Implications for theory

It has been suggested that the social realist school offers a clear theoretical basis for understanding the production of knowledge and its centrality to the curriculum. However, the dismissal of thinking skills initiatives *en masse* as anti-knowledge is rejected on empirical and theoretical grounds. Where Young associates critical thinking with genericism and de-differentiation in the curriculum, it is proposed that the principle of differentiation advocated by the social realists should be extended to the analysis of the different forms and functions of critical thinking found in different curriculum expressions. In a similar vein the social realist emphasis on the context specific basis of knowledge production could usefully be extended to recognise the relevance of different learning contexts to the acquisition of knowledge. The case study of A level Critical Thinking shows that it can play a part in sustaining and contributing to the development of knowledge learning and transmission, rather than detracting from it because of its skills focus. As evidenced in students' comments, critical thinking can enhance the depth and subtlety of their grasp of subject knowledge, whilst Critical Thinking itself has its own characteristic features as a field of knowledge. It has been noted that Young's analysis rests on a false dichotomy between knowledge and skills which mirrors the distinction between propositional and procedural knowledge. Specialist knowledge in either form could support the differentiation of educational knowledge from the everyday and they are in any case interdependent. Therefore it cannot be assumed that critical thinking automatically represents a threat to the knowledge curriculum.

It has further been argued that critical thinking is not only compatible with but is also essential to the social realist knowledge project. The thesis has made explicit the

common heritage of Young's account of knowledge, which sees it as generated and validated through the work of specialist communities, and the field specific conception of critical thinking which has provided the main alternative to the orthodoxy of the informal logic movement. Toulmin is a key source referenced in both traditions. The realist critique of critical thinking rests on an assumed 'universalist' form, whereas in noting the field dependency of standards of critical judgement, authors such as McPeck and Bailin *et al.* offer a concept of critical thinking which complements the realist view of knowledge. Moreover it can be seen as essential to achieving the kind of openness to interrogation and critique which the realists associate with powerful knowledge. By bringing together strands of sociological theory of the curriculum and philosophical theory pertaining to critical thinking in this way, there is a strengthening of both analyses and a demonstration of the value of a multidisciplinary approach: it provides a theoretical basis for the justification of a knowledge led curriculum, which is largely taken as a given in the philosophical accounts of critical thinking and its relation to education; whilst also drawing attention to the means by which knowledge can be rigorously tested and secured through the application of field based critical thinking.

7.2.2 Conceptual development

An overview of the origins of and variations in concepts of critical thinking has been provided which differentiates approaches on the basis of their descriptive referents and their epistemological underpinnings. The critical capacity of forms of critical thinking such as that found in the A level is limited as a consequence of their derivation from a particular strand of the informal logic movement whose proponents largely adhere to a fallibilist epistemology. In this, warranty is tested through the match of reliable evidence to claims and through sequential reasoning free of flaws. As Burbules and Berk note, "critical thinking tends to address issues in an item-by-item fashion…*particular* claims are scrutinised…this tends to produce a more analytical and less holistic mode of critique" (1999: 56). This can be viewed as a one dimensional approach to critical thinking, lacking a second dimension in the form of specialist contextual knowledge, which is regarded as essential in the social realist approach to knowledge; and also a third dimension that recognises how underlying value positions may determine the context in which the sequential reasoning occurs. This third dimension was suggested in teacher references to theoretical or ideological positions that framed the issues contained in the texts provided in the West College teacher response activity. It is necessary to take the issue of interests beyond bias in evidence sources, and to broaden attention to assumptions beyond a focus on missing steps in reasoning to underlying beliefs and commitments; in other words attention to the ideological or paradigmatic framing of issues should be within scope for critical thinking as well as the minutiae of linear logic. In this

respect matters of power and interests are restored to significance for the exercise of critical assessment, where in positing the relative autonomy of knowledge, Young had de-emphasized these in stressing the need to avoid reducing knowledge to a matter of 'expression of interests'.

A curriculum underpinned by a social constructionist (*not* constructivist) epistemology which is compatible with realist ontology (Crotty 1998: 63) is proposed to support realisation of critical thinking. This represents a break with the fallibilist epistemology of Popper

> *Piecemeal criticism is an unduly limited form of criticism, despite the rigour… the problem is that, because it is piecemeal, it fails to take on the form of knowledge as such. Any ideological presuppositions – for example about the epistemological or even the technological superiority of a form of knowledge – will go unchallenged…The edifice of knowledge will remain intact, safe from criticism.* (Barnett 1997: 23)

Barnett sees the prevailing 'assembly of skills' model of critical thinking, as found in the practice of A level Critical Thinking, as a "blinkered approach to the matter…critical thinking without a critical edge" (1997: 17) which precludes the potential for "panoramic critique" (p.27). The recommendation here to place critical thinking in relevant knowledge contexts in keeping with a social realist approach, matches Barnett's description of 'critical thought' which "begins to supply such a critical edge" (p.17) through recognition of the standards generated in communities of specialists. However, Barnett also notes the location of power interests in the creation of closed scientific or knowledge communities. The third dimension to critical thinking noted above corresponds to his advocacy of 'critique' as a capacity to invoke metacriticism about the very basis of belief in a discipline. This requires awareness of and attention to the foundational assumptions of a body of knowledge and depends on 'reflexive capacity' and a 'critical interdisciplinarity' (Barnett 1997: 18-19). Barnett proposes these as three levels of criticality offering "an ever broadening horizon in which critical reason can operate" (p.19). It is contended here that these are better construed as concurrent dimensions rather than as a sequence of levels or stages as all are essential to purposeful and progressive critical engagement with knowledge. Only with this multiple dimensionality can critical thinking carry and convey the credibility and conviction required in a social realist conception of the curriculum.

7.2.3 Pedagogical implications

> *To study without thinking is futile. To think without studying is dangerous* (Confucius, Analect 2.15, Leys 1997: 8).

Responses from student and teacher samples suggest that Critical Thinking as an A level promotes skills which are *necessary* for successful study and which are not always explicitly articulated and developed through other subjects. However, the generic skills involved are not *sufficient* to guarantee an adequate form of criticality on a subject basis, where depth of critical analysis is inextricably linked to relevant contextual knowledge of, for example, a conceptual, comparative, historical and theoretical nature. It is argued that critical thinking should play an integral part in a knowledge driven curriculum as championed by the social realists. It is proposed that there needs to be "a mix of localised and more general rules" (Johnston *et al.* 2011: 29), in other words recognition that there are broadly applicable features of critical reasoning but also subject specific conventions for critical engagement with objects of study in particular fields.

In the case study most students felt they were not taught critical thinking skills through their other A level subjects, even though teachers might expect them to demonstrate them in assessed work. It has been recognised that explicit teaching of generic skills is essential as otherwise these may not be modelled or developed in the normal course of teaching subject content (A. Fisher 2001, Smith 2002). This could be achieved with a separately identified critical thinking component as a compulsory core of all programmes or using an infusion approach "where there is subject matter plus explicit discussion of critical thinking principles" (Johnston *et al.* 2011: 29). A fully embedded immersion approach "where general critical thinking principles are not made explicit" (Johnston *et al.* 2011: 29) will not suffice as evident in the views of East College students, and this calls into question pedagogical schemes such as PLTS. The efficacy of this is dependent on whether such a policy is implemented at a national or local level, on a compulsory or voluntary basis. There are significant staff training implications, particularly with the infusion approach.

Field specific aspects of critical thinking also need to be more clearly articulated in the interests of learners and also their teachers. Whilst this might be seen as simply a facet of professional socialization, lack of articulation of key principles and criteria limits the potential for developing learning. In an adaptation of the words of an Art teacher:

> *[Critical thinking] should always be viewed in context. Should [critical thinking] - in particular that designed for mass consumption - be left to*

> *those who have little or no knowledge of the subject but rather a dangerous ability and potential to mobilise public opinion?*

Johnston *et al.* have summarised a number of differentiating factors between fields, including methodological considerations as well as expectations regarding the warranty for truth claims (2011: 30-31). While there is mention of 'organising concepts' and 'specific knowledge base' this could usefully be enhanced by developing the notion of 'context' as an overarching category which is crucial to the interface and interdependence between critical thinking and knowledge. This consists of the information base of the subject and its conceptual and theoretical repertoire, and also of field variant aspects of the inner logic of subjects. However, while examples of the importance of subject knowledge to effective critical thinking abound, there are few examples to demonstrate how logical procedures and criteria for critical evaluation vary according to discipline. The need for this is highlighted by writers such as Bailin *et al.* (1999) and Johnston *et al.* (2011). R. Moore similarly makes the case for recognising the 'sociality of judgement' in a social realist discussion of the notion of a literary or artistic canon. However, while he refers to "publicly shared procedures and criteria" (2010: 145) that elevate aesthetic judgments beyond a matter of personal preference, Moore gives no indication of just what these procedures and criteria involve nor of the extent to which there is a consensus concerning their relevance and significance. An indication of what this might entail is given in T.J.Moore's small scale study of the different 'critical cultures' found across the academic disciplines of Philosophy, History and Literary Studies. T.J. Moore notes that expectations in Philosophy directly match the emphasis on critical reasoning skills found in generic critical thinking programmes like the A level: "it's about identifying an argument and evaluating it", whereas "history did not so much involve the 'rendering of judgements' on the *arguments of others*, as the ability to draw on various sources and materials to develop one's *own arguments*" and in Literary Studies "the critical mode…was not one of standing in judgement of texts *per se,* but, rather for students to develop their own particular interpretation of them…in some 'lateral' way" (2011: 267, original italics). T.J. Moore notes that

> *it may be folly to imagine that there is a single core of meaning for the term, which in turn is reducible to a defined set of cognitive operations… critical thinking …refers to…a multiplicity of practices…for the philosopher…analysing the logico-semantic relationship of propositions. For the historian…the creative use of sources to construct a picture of past events and phenomena and for the literary critic…use of certain literary and aesthetic concepts as a basis for exploring and interrogating texts.* (2011: 271)

Work on the features of discipline specificity is essential to the social realist project for the curriculum and it is also suggested that development of a social realist concept of critical thinking should recognize that what counts as relevant context will differ for different groups of learners in different epistemic situations according to factors such as the level, type, subjects and institutional setting of their courses. This proposal is consistent with the realist approach to research and evaluation proposed by Pawson and Tilley (1997), which suggests that outcomes (e.g. educational or social) result from a combination of mechanism (e.g. pedagogical strategy) and context (e.g. curriculum structure, subject and level).

7.3 Review of Research Methodology

The overall methodology involved mixed methods selected for pragmatic purposes in relation to the focus of the research questions, within a qualitative framework:

> *Being pragmatic allows one to eschew methodological orthodoxy in favour of methodological appropriateness as the primary criterion for judging methodological quality, recognising that different methods are appropriate for different situations. Situational responsiveness means designing a study that is appropriate for a specific inquiry situation or interest.* (Patton 2002: 72)

As such the primary basis for evaluation of the study is the relevance of the methods selected, the effectiveness of their implementation and their success in answering the research questions. More general reflections on the methodology using a range of criteria for judging the quality of research are considered below (adapted from Miles and Huberman 1994, Seale *et al.* 1999 and Denscombe 2007). The main focus of this is on strengths and limitations of the primary research undertaken and there is also consideration of issues concerning the selection and use of literature.

7.3.1 Representativeness

The literature about critical thinking is vast and it is not claimed that the full spectrum of research and theory has been reflected in the thesis. Rather texts were selected purposively to explore the underlying concept, policy and practice of critical thinking in PCET. This means, for example, that philosophical rather than psychological texts were prioritised as it quickly became apparent that Critical Thinking A level derives from the informal logic movement; texts specifically on interventions in PCET were considered whilst limited reference was made to the extensive range of research reports on the impact of critical thinking in other educational sectors. The identification of key texts

representing theory espoused, such as those of Dewey, Ennis and McPeck, was informed by recurrent references in multiple overviews.

It may be considered that there are issues of representativeness with the primary research samples. The case study involving A level Critical Thinking students was deliberately based on an 'exemplar' centre to ensure the optimum conditions of its delivery. It is acknowledged that this may not be representative of the experiences of the majority of such learners. However, this was a purposive sample designed to capture students' experiences under optimum conditions and thus demonstrate aspects of potential as well as actual experience. As such this provided a valid test of the generalised dismissal of critical thinking in the comments of Young and Furedi.

7.3.2 Validity

This is described by Denscombe as a matter of 'accuracy and appropriateness' (2007: 297). The selection and interpretation of literature and primary method choices were guided by relevance to research questions concerning definitions of critical thinking, its expression in A level form, and the accuracy of accounts of critical thinking in curriculum theory. The primary research undertaken offered valid insights into the perspectives and experiences of a sample of students undertaking critical thinking and is thus a significant improvement upon curriculum theories which simply assume the nature of these experiences (Young 2008) and attribute meaning to them based on personal preconceptions (Furedi 2004, 2009). The methods used in the student case study gave opportunities for expression and development of individual views through a variety of forms. The different methods were deliberately sequenced to allow open expression of views first through private written responses to questions, before introducing participants to quotations to respond to and leading onto further group discussion. Overall there was a high degree of consistency of response through these three phases, suggesting a coherent concept of critical thinking and endorsement of its transferability and value.

There were some issues of validity in the responses given to quotations presented due to uncertainty over the meaning of words used or responses directed to specific parts of multi stranded statements. However these were not intended to act as a neutral reflector of pre-existing views but to stimulate thinking afresh, especially when seen in tandem with the subsequent group discussion. This discussion process took 'member validation' beyond a confirmatory function *vis-à-vis* researcher interpretation of responses (Seale *et al.* 1999: 61) by inviting more extensive reflection and articulation of thinking. More conventional member validation was used with the teacher sample as the initial analysis and interpretation of responses was checked with participants, in keeping with a collaborative culture of 'reflective professional development'. Participants recognised the

applicability of the researcher's categories of analysis and their observations led to some modification and qualification of conclusions drawn.

Student views were elicited in three different forms, with this 'triangulation' demonstrating a high degree of consistency in their responses. The teacher sample was in a different institution and involved a different activity, but the juxtaposition of the outcomes from this with features of student responses was significant in relation to the central issue of the relationship between the knowledge curriculum and critical thinking. The use of multiple methods reflected multiple facets of the study and at the same time helped crystallise key concerns, set against the context of theoretical and policy standpoints.

7.3.3 Reliability/Objectivity

The influence of personal roles, values and interests on the focus and design of the study has been acknowledged. It is suggested that the unique biographical configuration of the researcher has had a positive effect on the research, bringing to bear extensive working knowledge of the field of critical thinking, alongside a multidisciplinary awareness drawing upon sociological and philosophical traditions. In presenting findings, substantial participant text has been provided through selective quotation and also full transcripts, showing how researcher interpretations are grounded in the accounts of participants. The starting stance of the researcher was neither wholly positive nor negative about critical thinking as an A level and throughout attention has been paid to alternative concepts, interpretations and theoretical standpoints.

7.3.4 Ethical issues

Ethical practices were followed in the primary research as indicated in the methodology chapter. In the spirit of participatory research the author's analysis and interpretation of results was shared with the teacher sample at West College. This provided general validation of the findings and stimulated development of the consideration of the implications of the research. This post analysis follow up was not possible with the student sample at East College as the assembly of findings was completed after the students' left college. However, opportunity for participant validation was built into the structure of the method sequence; also the analysis and interpretation of findings was shared with the key staff contact at that college with an invitation to comment.

In relation to the exploration of theoretical aspects of critical thinking, the integration of a normative dimension has been noted in the account of expert definitions and descriptions and in the views expressed by students. However, the relative invisibility of this aspect of critical thinking in practice has not been explored. This would be a fruitful further avenue

for investigation, drawing on MacIntyre's critique of the separation of logic from morality in the Enlightenment with the move to "mechanical explanation" (2007: 82) in which "is becomes a stranger to ought" (p.84). In particular it might be considered that a fully realised social realist concept of critical thinking would need to encompass the ethical along with the rational.

7.3.5 Analytics

Although qualitative in general design, frequency counts were used to analyse data from the student response activities, with the benefit that "we saw the overall trends, got some new leads, and saw some unexpected differences. All these findings helped with the subsequent non-quantitative analysis. Even with a single case, that kind of exercise [was] a useful one" (Miles and Huberman 1994: 253). The frequency counts gave a starting point that was used together with interpretations of qualitative data from discussion, ensuring "that it goes beyond *how much* there is of something to tell us about essential *qualities*" (p.253*).* Miles and Huberman also see such counts as useful for verifying a hypothesis and ensuring analytical honesty, for example here in reflecting the dominance of a focus on 'argument' in student definitions of critical thinking. Without this researchers "tend to overweight facts they believe in or depend on, to ignore or forget data not going in the direction of their reasoning, and to 'see' confirming instances far more easily than disconfirming instances" (p.253). This was evident in the researcher's initial finding that students saw critical thinking in terms of evaluation of reasoning and evidence, until a count prompted by supervisor observation showed that fewer references were made to evidence issues, so "the aid of numbers is a good way of testing for possible bias and seeing how robust our insights are" (p.254). 'Simple counting techniques' were thus used to ensure "the 'generality' of phenomena within a case is established, rather than some statistical estimate of the extent to which phenomena are likely to occur outside the case" (Seale *et al.* 1999: 128).

A further feature of the analytics was the dialectical interplay between description of findings and theoretical context. The choice of participant quotes in part reflected prior expectations but was also used to present new and unexpected insights and to highlight views of particular significance to the thematic and theoretical concerns of the study.

7.4 Recommendations for further research

In response to limitations noted in the methodological evaluation, together with identification of themes arising from the thesis that warrant further exploration, a number of suggestions are put forward for improvement and further development of research into critical thinking in PCET.

7.4.1 Enhancement of current study

Each of the following would provide evidence that would inform and strengthen conclusions drawn in the thesis concerning the value of A level Critical Thinking, especially in relation to the broader A level curriculum:

(i) More direct evidence of transferability of skills to other subjects. Self identification of and confidence in this capability is much in evidence in the study and this would be stronger were there direct evidence of the outcomes of this transfer, for example through teachers' assessments of sample Critical Thinking students' performance in other subjects compared to that of equivalent peers.

(ii) As a specific extension to the above a systematic comparative study of the approaches to learning of Critical Thinking students could be undertaken. This could involve either a longitudinal approach which gives a 'before and after' view of students' approaches to learning, or a comparative study between Critical Thinking and other A level students of a similar profile and at the same stage on their course. In linking this to Entwistle's categories of deep and surface learning, particular attention would be paid to any differences in scores on the 'serialist' and ' holist' elements (Entwistle 2000: 3). This is directly relevant to the central debate about generic or field specific critical thinking as it would reveal whether critical thinking supports serialist aspects of deep learning such as logical sequencing but not 'holist' ones to the same extent as this involves "relating ideas to previous knowledge/experience" and "using organizing principles to integrate ideas" (Entwistle 1991: 1).

(iii) While the case study sample was a sufficient test for the generalisations about critical thinking of Young and Furedi, it may not be representative of more varied learning situations, for example where Critical Thinking is taught in fewer hours by less experienced teachers, so a wider sample could be taken.

7.4.2 Policy context and proposals for further research

The primary research into policy experienced has focussed solely on the discrete A level Critical Thinking. This could usefully be supplemented by research on thinking skills across wider aspects of the curriculum, especially in the light of recent educational policy changes.

Apprenticeships and vocational diplomas

A potential line of research would involve investigation of the nature of thinking skills expected, taught and assessed under the broad PLTS scheme of vocational qualifications. This is the kind of operating context that Young appeared to have in mind in his reference to 'soft genericism'. However, at the time of writing the future of such schemes is in doubt following the Wolf report (2011), which noted the limited take up of New Diplomas (less than 1% of students) and proposed concentration on GCE qualifications for 14-19 year olds. While the take up of the flagship Diploma qualifications was very low and the contribution of 'critical thinking' to the 'thinking skills' involved was not specified, PLTS has become more institutionalised in the last two years as it has formed part of the requirements for new Apprenticeship frameworks, alongside functional skills in literacy, numeracy and IT. Given the continued policy emphasis and funding priority on Apprenticeships following the change of government in 2010, this is a significant area for research. Such an investigation could consider learners' and teachers'/assessors' understanding of the skills and processes undertaken and relate these perspectives to models of thinking skills such as Lipman's (2003) scheme based on critical, creative and caring thinking. It could also reveal the nature and efficacy of pedagogical styles deployed. As PLTS criteria are cross referenced against framework learning outcomes criteria, it is hypothesized that a 'checklist' approach to assessment rather than a developmental learning process is encouraged and if so this would seem to reflect the 'auditing imperative' of a technical instrumentalist approach as criticised by Furedi and Young.

A level reform

In 2012 Minister for Education, Michael Gove announced his intention to carry out a review and revision of A levels in the UK, with potentially significant implications for students and teachers in schools and colleges given that A levels make up 72% of qualifications entered at level 3 (Sykes 2010: 11). The decision to initiate the review was influenced by the dissatisfactions with A levels reported in the Sykes Review (2010) commissioned by Gove as Shadow Education Minister under the previous administration. These include concerns expressed by university academics about the depth of content of A levels as well as issues with modularised assessment structures. In a letter to Ofqual requesting public consultation on reforms, Gove expressed "concerns regarding both subject content and assessment at A level" and states that he is "keen that universities should be able to determine subject content" (2012). This reflects a view that preparation for University remains a key role for A levels and also a desire to connect the A level curriculum more directly to the work of those at the forefront of knowledge creation,

hence “a particular emphasis on our best, research intensive universities such as those represented by the Russell Group” (Gove 2012). The consultation period closed on September 13th 2012 and the next steps planned by the government in the light of responses received have yet to be announced at the time of writing.

Gove has been described by Young as a ‘traditionalist’ (2010b: 22) and this is supported to a degree by his reference to the self designated elite universities of the Russell Group and his inclination towards a return to traditional end of course examinations as a form of assessment. It is particularly evident in his suggestion that at the forefront of change should be those “subjects that are most important…the Russell Group ‘facilitating’ subjects” (2012) which are the traditional humanities, languages and sciences, echoing the emphasis on “traditional subject disciplines” as the core of any reformed National Curriculum in the White Paper (DfE 2010: 41, para 4.8). The proposals issued for consultation could also be interpreted as a move that would strengthen the place of knowledge at the heart of the curriculum as advocated by social realists. To gain approval for a qualification it is proposed that there has to be evidence of

> *the support of at least 20 UK universities, at least 12 of which are respected in the specific field of study and/or from those deemed to be leading research institutions; and has been developed in consultation with schools and/or colleges to ensure that the qualification is manageable for successful delivery.* (Ofqual 2012: 24, para 74)

By linking up knowledge producers and those responsible for knowledge transmission, this appears to match the prognosis offered by Young and the social realists that “the knowledge stipulated by the curriculum must be based on specialist knowledge developed by communities of researchers” (Young 2010b: 25), thus “giving students access to the most reliable knowledge that is available in particular fields” (p.27). Young envisages an ongoing dialogue: “Specialist teachers will need to be involved with university based and other specialists in the ongoing selection, sequencing and inter-relating of knowledge in different domains” (2009b: 17). Young agrees with the emphasis on ‘epistemic access’ as a key principle for a revised National Curriculum (2012b: 2) as set out in the Expert Panel report (DfE 2011: 11, para 1.2).

The Ofqual Consultation document states the view that “those in higher education and learned societies should be more involved in deciding the detailed subject content of A levels” (2012: 7) in order to address the need for “greater clarity over the core knowledge required in some subjects” (Ofqual 2012: 9, para 13) identified in the Ipsos MORI commissioned research (Higton *et al.* 2012). However, this was not the main concern of those in HE interviewed, “it was rather students’ acquisition, retention and reflection upon knowledge which were the primary concerns…those in HEI are typically most concerned

about skills deficits in basic literacy and numeracy and the ability to form and analyse arguments" (Higton *et al.* 2012: 68-69). Higton *et al.* note that "there was a general perception that there are some specific skills missing among a large proportion of the A level student body" (p.71). Prominent amongst these, in addition to core skills, academic skills and synoptic learning skills, is "**critical thinking**: constructing balanced arguments from evidence, assessing the validity and soundness of arguments" (p.71, original emphasis). The perceived weaknesses of A level candidates in this regard are that

> *students often had poor critical thinking skills which were characterised by a tendency to accept arguments and information uncritically. So while they understood the content of the syllabus they were unable to apply their knowledge. They were able to remember factual information but not to critically assess or really understand the materials they read*. (Higton *et al*. 2012: 77)

The Ipsos MORI research explicitly identifies the importance of critical thinking in preparation for higher education study and it is an important consideration emerging from the report of the research given the expectation that this is a key role for A levels. The report identifies skills deficits rather than gaps in knowledge content as the main perceived weakness with A levels, and inadequate critical thinking is prime amongst these. The earlier Sykes report had proposed inclusion of 'reasoning skills' in a standardised universities admissions test but this had been dropped by the time the Ofqual Consultation was published. There is little indication of how the critical thinking 'deficit' might be addressed in either the research report or subsequent consultation document. In the latter the lexical referent has been modified to the less precisely defined 'critical reflection' (Ofqual 2012: 9,14,21) and where it might be expected that A level Critical Thinking would be given consideration as a potential solution to the skills gap, instead the only mention of critical thinking in the report is as an example of a non-standard subject that "does not lead to a specific course of study at university but does enable students to expand their knowledge in a particular area of interest " (p.26, para 75). Instead of exploitation of its focus specifically on the analysis and assessment of argument and evidence, critical thinking appears to be relegated to the status of a 'hobby' subject, cited only as an example of a subject for which approval will have to be sought 'by exception' under the new qualification approval process envisaged.

The rapid disappearance or de-focussing on critical thinking from the reform agenda seems puzzling and may reflect the unease of traditionalists with 'critical thinking' as a curriculum entry (*cf*. Woodhead, cited in the Introduction). Given its significance to the findings of the Ipsos MORI research, it would be timely to take the opportunity to

undertake research into critical thinking designed to clarify and plan for appropriate inclusion of it in curriculum development at A level. The specification and scoping of such skills should be a key part of any review and revision of the A level curriculum both in general and on a subject basis. Three possible avenues of research are recommended:

(i) Responses made by staff and students in the thesis primary research suggest that there is ambiguity and uncertainty concerning just what is expected by way of the 'higher evaluation' skills that the syllabi specify have to be demonstrated to achieve top grades in A levels. A useful strand of research would be to investigate the occurrence of critical thinking in an embedded form in a range of A level subjects and its relation to higher level evaluation skills. This could include observation, interview or focus group methods designed to establish if and how critical thinking skills are explicitly taught in such contexts and the extent to which they are recognised and articulated.

(ii) Use of focus group or NGT methods involving both academics and A level teacher specialists from within a discipline could lead to clearer articulation of the critical skills expected within different subjects, how they might be assessed and how they might be taught (*cf.* T.J. Moore 2011). How these skills are described could be compared to the critical thinking skills and dispositions derived from the informal logic movement and embodied in A level Critical Thinking syllabi, assessment and practice; alternatively they could be compared to a wider array of intellectual resources for critical thinking such as those identified by Bailin *et al.*: "These include background knowledge, knowledge of critical thinking standards, possession of critical concepts, knowledge of strategies or heuristics useful in thinking critically, and certain habits of mind" (1999b: 286).

(iii) Given evidence from the thesis primary research concerning the desirability of combining generic critical thinking skills with subject contextualising, a different kind of study using experimentation or action research could be devised to trial materials co-prepared by subject and Critical Thinking specialists, with a view to gauging impact on subject mastery and performance. Alternatively this might involve trialling creative timetabling of skills sessions based on this two pronged approach.

7.5 Concluding statement

Young and Furedi make selective reference to critical thinking as a form of soft genericism in support of their 'evacuation of knowledge' thesis. It has been argued that

there is potential for a more refined, comprehensive and valid interpretation of its extant and potential role in the curriculum through a more differentiated application of Young's own social realist interpretive framework. Attention to contrasting generic or field specific concepts of critical thinking reveals that it is the former that is dismissed by Young, while the latter is commensurate with and necessary to Young's social realist concept of knowledge. The paradox of Young and Furedi's anti-knowledge thesis can be resolved by relating McPeck and Bailin *et al.'s* model of disciplinary specificity in critical thinking to Young's advocacy of knowledge as the central component of education. Young's vision for educational policy based on alternative social realist curriculum principles and practice would be enriched by inclusion and elaboration of what has been proposed as a 'social realist concept of critical thinking'. This would be realised in a contextualised form that ensures epistemological congruity between the concept adopted and its pedagogical expression. A form of epistemologically infused critical thinking is imagined which is sensitive to the structure and conventions of argument and justification in different fields. These considerations are particularly apposite at a moment when the A level curriculum comes under review and could face major revisions, and surrounding which it is likely public debate will be defined by allegiances to traditionalist, progressive liberal or technical instrumental ideologies unless the social realist voice is heard.

APPENDICES

Appendix 1 Questionnaire

Introduction

This questionnaire is part of a piece of research into the meaning and value of critical thinking in further education. In the light of your experience of following a course in critical thinking, please answer the following questions. The information you provide will give insight into how critical thinking is perceived by students taking courses in critical thinking at this level of education.

Thank you for your assistance

Mark Howarth, PhD researcher, University of Southampton

Your courses: please indicate the other subjects you are currently studying

Questions

The following questions were included in the questionnaire and space was left for open, written responses.

1. How would you define the term critical thinking?

2. What have you learnt by doing a course in critical thinking?
   Prompts: what do you know as a result of studying it?
   what can you do as a result of studying it?

3. Has critical thinking affected the way you approach studying other subjects?
   Prompts: If yes,
   (a)please explain how
   (b)please give a specific example of how you have used critical thinking skills in another subject (or state if you are unable to do so)

4. Are skills from your critical thinking course enough to enable you to evaluate material effectively in other subjects?
   Prompt: if not, what else is needed?

5. To what extent do other subjects teach you critical thinking skills?

6. Has studying critical thinking affected you in any ways beyond your courses of study? (Please explain how)

Thank you for completing the questionnaire

Appendix 2 Questionnaire results: table of responses, notes and codings

Student Number	Your Courses	Coding
1.	Sociology, P.E.	
2.	Business (A2), Maths (A2)	
3.	Film Studies, P.E	
4.	Media, English Lit	
5.	Sociology, Law	
6.	Photography, Graphics	
7.	N/A	
8.	N/A	
9.	Health & Social care, Psychology	
10.	Religious Studies (AS), Philosophy (AS), Sociology (A2)	
11.	Media studies, Philosophy, Sociology	
12.	Sport Diploma (BTEC Level 3)	
13.	Physics, Maths, Chemistry	
14.	Psychology (A2), Religious Studies (A2)	
15.	Sociology, P.E (A2)	
16.	Psychology, Sociology	
17.	Maths (GCSE), Media Studies (A2), Film Studies (AS)	
18.	Business (BTEC), Film Studies	
19.	Law, Sociology	
20.	Film Studies, English Language	
21.	Photography, Psychology, Health & Social care	
	Nb 4/19 doing 4 As inc CT; 2/19 doing BTEC Vocl courses; 13/19 doing 3 As in total; 2 did not complete this section	Only 1 doing Science A levels, most socsci/hums/arts

Student Number	1. How would you define the term critical thinking?	
1.	Critical thinking is assessing and developing arguments.	A Ev D
2.	The ability to assess, interact and develop arguments. Also how to put views across and state opinions whilst analysing and listening to others views.	A Ev D
3.	The ability to think critically about information given to you.	C
4.	The ability to think calmly, logically and quickly even whilst under pressure and be able to deconstruct analyse and respond if needed to information.	An C P L
5.	The power of arguments, whilst looking in detail at all aspects of arguments.	A An
6.	Structure and development of arguments.	A An D
7.	To think about things more thoroughly. To be picky on points that are made.	C E J
8.	The study of argument.	A
9.	The ability to think more effectively to argue more effectively. Analyse a piece of texts and find out the strengths & weaknesses.	A An D E J
10.	The ability to argue your point with a group of people. Also the ability to pick apart of peoples arguments in order to argue back effectively. It also gives me an idea of how to take what people say, i.e. if they are credible or not.	A An D E J Cr
11.	The study and practice of being able to argue correctly and effectively.	A D J
12.	Thinking critically, taking time over things, breaking down and analysing studying arguments.	A An
13.	The ability to consider different points of view, arguments and ethical reasoning to come to a logical conclusion.	A D L Eth
	Being able to think more clearly about arguments	A An

14.	structures etc..	
15.	Understanding arguments and breaking them up to find weaknesses and strengths.	A An E
16.	The study of argument structure and skills to strengthen the way you argue.	A D
17.	To be able to think clearly or fast in critical conditions.	J D
18.	To me it means being able to criticise something and being confident about doing so.	C D
19.	Critical thinking means the ability to form and analyse arguments, pieces of text in order to know the weaknesses and strengths. And also how to solve dilemmas with debates.	A An D E P
20.	Critical thinking is a discipline or a guide to how you approach a certain subject. For example, to make a fair judgment in any circumstances, or not to ignore anyone who is making a point (in others an argument).	A E J D
21.	I would define it to be something that you come across during life that needs strands of reasoning. For e.g. being able to think through a situation without being negative about the outcome. It makes you think through various layers in arguments.	A An D J

Initial, general coding:

C = critical response to information
P = problem solving
L = logic
J = judgement
Cr = credibility
Eth = ethical reasoning
Sub-codes, refining aspects of 'argument':
A = ref to argument; An = analysis or assessment of argument (including ref to structure, breaking down, looking in detail at); D = development of argument (or strengthening, putting across effectively); E = evaluation (inc identifying strengths & weaknesses)

Judgement words – *how* do it eg calmly, thoroughly, fair etc

Student Number	**2. What have you learnt by doing a course in critical thinking?** Prompts: *What do you know as a result of studying it?* *What can you do as a result of studying it?*	
1.	I have learnt how to pick out flaws in peoples arguments and to question most things that have been told to me by others. I have also learnt how to structure my arguments better in order to win a debate.	F Dw A E Dis D proc
2.	What makes an argument stronger or weaker. How other factors like evidence and examples effect an argument. The best way to approach an argument. The most effect way of getting your point across, it can be put into daily issues where they use of words can be persuasive. How to analyse information and arguments to come to a conclusion. Also making you aware of both sides of an argument.	A An D prop proc
3.	What I know as a result in studying critical thinking are the flaws in arguments in greater depth. As a result of this I can pick people up on their flaws when in an argument. Another thing I know from studying is why people make decisions more clearly than previously.	F E Dec A Prop proc
4.	I have learnt to argue better, be it giving good reasoning or better structure as well as avoiding common flaws in my own arguments. Definitely criticising others arguments easier, by detecting flaws or realising the relevance/significance of things presented. That sitting and thinking for a period of time is often better than charging head-first into a challenge.	F D A T proc
5.	It has made me much more aware of mistakes when in my other lessons. It has also helped me when having to write essays as I know not to contradict myself. Also helps on my persuading techniques in everyday life.	A Proc Essay skills Everyday argument
6.	I have learnt to use varied skills to win debates, and have learnt what mistakes people do within arguments and how to detect these weakness. Learnt to pick out elements within passages of text the either support or weaken an argument.	F E An A Proc Winning Debating
7.	I have learnt to think things over more thoroughly before taking any actions. Be able to do work quicker and more successfully by taking a logical approach. I have learnt how to argue my point across without slowly slandering onto another subject. I can now pick up on peoples	T F E dis Proc

	flaws/faults in arguments and correct them if needed.	More effective work
8.	How to analyse arguments structure and how to find their strengths and weaknesses. It has made me better at winning arguments and structuring stronger arguments.	A An E Proc Winning arguments
9.	Argue better, point out when people are in the wrong, find flaws in peoples arguments you wouldn't otherwise know write arguments better.	F E A Proc Better arguments
10.	I have learnt how to argue effectively. Pick apart other peoples arguments. Work out credibility of certain sources. It relates to many subjects as you need to be able to argue in other lessons as well.	A An Cr Proc Transfer to other subjects
11.	As a result of doing critical thinking I have learnt to not accept everything at face value but to look at something and find what it is someone is trying to get across and how they are doing it.	Dw An proc
12.	I have learned how to recognise flaws and rhetoric in arguments. I have learned how to overcome and win arguments. I have learned how to think whilst arguing. I have learned how to stay calm during arguments. I have learned how to analyse documents and articles and know whether they are good or not using the BRAVEN system. I am learning about utilitarianism and duty ethics.	F A An Cr Eth theory T Proc prop Winning arguments
13.	I can recognise when people use flaws in reasoning (to me) so I know their reasoning for something is poor and I could not be persuaded so easily than before the course by ''any old'' information.	F Dw Proc More savvy
14.	Know how to structure an argument. How to think more clearly about things. Morals (types of them). Know how to find flaws in arguments.	F A D T Eth proc
15.	I have learnt that you should question things in life rather than just accepting them. As a result of studying it I can now decide whether someone's a good arguer or not, I can also argue my point better than I ever used to be able	Dw A Proc Disp Better arguments

	to.	
16.	By studying critical thinking I have learned how arguments are structure, and helps me develop my arguments to make them become stronger. It has also taught me a lot about credibility and that not all information/statistics is accurate or reliable.	A D Cr Dw Proc prop
17.	I now know what to look for in peoples arguments and I now know how to counter them. I can pick up flaws in different documents I read and point them out.	F A Proc Better response to argument
18.	I can think more critically about things. Learn to not trust everything you hear. Not just take things as it is.	Dw Dis
19.	I have learnt to analyse properly and to be able to define techniques used to help make arguments/debates better.	A An D Better debate/arguing
20.	I, as a result of studying this course understand now that the world is full of opinions and there will be people trying to argue for it. That is fine. The course has taught me whether to be convinced by it. This means what I can do now is not be convinced by opinions that are not logical by identifying its weaknesses.	(F)/E Dw
21.	I have learnt to be more confident, I feel that I can speak my own mind instead of ignoring it and pretend that it never happened. I can think in between lines instead of directly reading what has been written. It's made me a more serious person but yet a very relaxed person. I am not piled with things to say on my chest.	T Dis

Codes as above for q.1 plus…

Prop = propositional knowledge (that); proc = process knowledge (how); A = strengthening/improving own arguments; F = reference to flaws; Dw = 'Deweyan' – not accepting things at face value; Dec = decision making; T = thinking more clearly, calmly (reflectively) not rushing; Dis = dispositional

Student Number	**3. Has critical thinking affected the way you approach studying other subjects?** Prompts*: If yes,* *(a) Please explain how* *(b) Please give a specific example of how you have used critical thinking skills in another subject (or state if you are unable to do so)*	
1.	Slightly as I do sociology and I have to evaluate theorist and their theories. Critical thinking has made me question their theories more and not accept what they say as always right. Also in class discussions I can give a better argument.	Sociology Disp Y Ev
2.	Yes. More confidence to say my view and assess other peoples views. Also that what I am saying can be supported by relevant appeals and experience. When coming to conclusions in Business Studies whether spending that amount of money is good or not and why.	Business Studies Y Disp Dev
3.	No it has not affect the way in which I approach other subjects.	N – PE/Film studies
4.	Yes, teaching me to sit and think before approaching a question. When needed to complete an English essay in timed conditions, rather than planning I sit and think my answer out, the structure and information used. Occasionally jotting notes down to remind myself as I go through the essay.	English Y Disp Dev
5.	Yes for example in sociology when we have to make good and bad points in an essay, it has taught me not to make my arguments circular. Also in class discussions and debates it has helped me point out flaws in peoples arguments whilst getting my points across clearly.	Sociology Y Dev Ev
6.	No, as I do Art based subjects I do not use critical thinking in my subjects however outside of my lessons my critical thinking skills do come in handy for example getting my point across in certain debates me and my friends have.	N - Art
7.	Critical thinking has taught me to think about how I am going to achieve a task first before I approach it. This helps to make a plan my task turns out more successful this was. For example, my art work such as Textiles involves a lot of practical work, designing and making. If I plan my design, it has more of a chance of having a good	Art/textiles Y Disp

	outcome.	Dev
8.	Yes, I have been easily able to see strengths and weaknesses in work for other subjects when for example analysing research which helps for me to get the right sources.	Y Ev
9.	Yes, because it improves your English skills so your writing in other essays of exams improves. In health you have to analyse texts and critical thinking means that you are more able to do this and if you don't agree with the text then you can provide a better argument against it.	Health&care Y Dev
10.	Yes, when having debates in other lessons such as in R.E when we had to argue whether abortion was right or wrong we put together a plan so we could get all out ideas together. In Philosophy when philosophers use analogies to describe their point such as Paleys use of the waton, applying it to the universe. My knowledge of what an analogy was from my work in critical thinking helped.	RE, Philosophy Y Ev Dev
11.	Yes, it has allowed me to read/understand what I am being asked to do in far more clarity, this branches out to all subjects. However only effects the information I receive, as the responses I make are specific to that subject.	Y An N??
12.	No not at the moment as I am only studying a sport qualification.	N
13.	Yes, last year I took AS Psychology , and critical thinking helped me realise that the evidence the research that was carried out could not be universally applied as such a small amount of people were used for the experiments and usually from a small area, this led me to a certain point distrust a lot of experiments and the conclusions drawn, as in one experiment 11 people took part from a small town, which is not representative at all.	Psychology Y Disp Ev
14.	Yes, I have applied it in other subjects as I am able to think more clearly about things. In Religious Studies, I had to do a debate about abortion and I was able to pick out flaws in other peoples arguments.	RSts Y An Ev
15.	Yes because, I study sociology and we get to look at a lot theories by various theorist and when I look at the point there making sometimes I question and I ask myself. If this is right or wrong. Then I look at the strengths	Sociology Y Disp Ev

	weaknesses of their point.	
16.	Yes, I have applied my critical thinking skills my other subjects. It helps me to determine if the source is credible and if what the psychologists/sociologists say is represented fairly.	Soc/Psych Y Ev
17.	I don't approach other subjects any differently.	N – Maths, Media & Film
18.	It has because my way of thinking has changed in the way that I think more in depth about things around me. For example when watching films in film studies it helps me to work out why the directors have done something a certain way.	FilmStudies Y disp
19.	Yes it has because it has made me think about more of the structure of things and to go more in depth. I used critical thinking skills in my law work when analysing information to see the strengths and weaknesses.	Y An
20.	It has very much: Essay writing in particular. In Film Studies, it has allowed me to consider all aspects when analysing a film. Such as: what motivates a film to be made, the films strengths and weaknesses (if any). This is what we do in Film, but crit-think has made it a lot easier and makes us understand why we need to take this approach.	Film sts Y lots Dev An Ev
21.	Yes, In photography I analyse photos and I need to go through layers of meaning. This links to critical thinking as I dont rush myself. I spend more time thinking than writing because you tend to make more sense. In critical thinking we separate sentences as they have different functions. This is the same as photography, instead I separate the photo in sections and develop further. In psychology we deal with studies in different areas around the world. But we develop further understanding by being aware the for's + against in certain which also relates to critical thinking.	Photography, Psychology Y An Ev

Y = yes; N = no; Ev = evaluation; An-analysis; Dev – structuring, planning etc

Student	**4. Are skills from your critical thinking course enough to enable you to evaluate material effectively in other**	

Number	subjects? Prompt: *If not, what else is needed?*	
1.	No because I need some skills from my other subjects to help but my critical thinking skills are useful.	N
2.	Not suitable for maths where opinion isn't so necessary. But for Business you always have to make decisions and being able to decide whether the advantages outweigh the disadvantages is vital.	N/Y depends on subject
3.	I could see how it could benefit English language but it doesn't benefit either PE or film.	N
4.	Yes	Y
5.	Yes as it makes you realise what is good and what is bad in written arguments we're given. Helps to find the flaws and know how to respond to them whilst it also helps you find good points such as credibility of an author.	Y
6.	NO, I do not use skills in my other subjects as I do art based subjects I choose critical thinking as a way of learning new skills, but unfortunately don't link with my other subjects.	N
7.	Critical thinking skills do enable me to evaluate material in other subjects. They help me to pick out the things that I am doing wrong.	Y
8.	Yes they help with analysing and evaluating other work.	Y
9.	Yes	Y
10.	Yes, as it makes you realise what is credible material and what isn't. An example would be the sun we know that this newspaper is flawed as it exaggerates.	Y
11.	Yes, primarily written material that can be read and re-read.	Y
12.	Not at the moment as it is not needed in a sports course. The books used are from BTEC so they are reliable sources.	N
13.	Yes, as previously stated it allowed me to see the reliability of data in most psychology experiments.	Y
	Yes, it allows me to be able to understand any research based work in my other subjects as I am able to evaluate	Y

14.	whether it is a good source of information or not.	
15.	Yes I think so because it basically shows you how to pick out strengths and weaknesses effectively.	Y
16.	I can evaluate material from psychology & sociology more effectively because I have a thorough understanding of how articles can be for example bias. It helps me work out if they are reliable.	Y
17.	Yes, I remember what I have been taught and I use this to evaluate material effectively.	Y
18.	Yes as it helps to think outside the box, and with my writing for example when writing a review.	Y
19.	Yes, as I said above it helps me to 'evaluate'/analyse more effectively in my other subjects/	Y
20.	Yes, particularly looking for evidence and examples to reinforce points made.	Y
21.	I am able to tell the strengths + weaknesses of critical thinking and I am able to relate critical thinking to all my subjects.	Y

Y = yes; N = no

Nb language of support – allows, enables and especially 'helps' rather than sufficiency (interpretation of question?)

Student Number	5. To what extent do other subjects teach you critical thinking skills?	Do other subjects teach CT skills?
1.	Sociology teaches me how to evaluate but other than they don't.	L
2.	Not as much. Usually based on facts and not opinions.	L
3.	They basically really don't. With a minority of times they might, but it would be for such a little amount it wouldn't be significant.	N
4.	The other subjects that I do don't teach any critical thinking skills, save perhaps analysing in English.	L
5.	They don't really teach you to look at details of argument especially as most hide the flaws well to try and persuade you. But other subjects like law do teach you moral issues but teach them in a more formal way. Also helps find advantages and disadvantages.	L
6.	From studying my other subjects and studying critical thinking it has showed me to be more open minded towards critical thinking.	Y (Dis)
7.	Other subjects do not really teach me critical thinking skills, but this may be due to the current subjects I am taking.	N
8.	Other subjects teach you simple evaluative techniques which critical thinking expands on such as your taught about making sure evidence is reliable but with critical thinking you are taught to take more into consideration.	L
9.	Psychology teaches you about thinking and using your brain but not in the same way that critical does. And in other lessons you have class debates.	L
10.	They teach you the basics of how to argue and critical thinking enhanced debate those skills.	L
11.	Media studies teaches to look at the primary point institution nay be trying to achieve with its audience, this is similar to finding main conclusions in critical thinking. Other subjects do not.	L

12.	I feel that other subjects do not teach critical thinking skills. Critical thinking I feel is a skill which can only be taught on a critical thinking course. Subjects should not try and teach as I feel they would get it wrong.	N
13.	My other subjects do not (physics, maths, chemistry).	N
14.	Critical thinking skills can be said to be skills that we develop naturally anyway but I do not think that my other subjects do teach me these skills.	N
15.	I think my sociology class does in a way because we do get told to question theories and to say why the weak or why their strong.	Y
16.	None of my other subjects [psych/soc] really touch on critical thinking skills, except for evaluation as I have to pick up on weaknesses in the studies for example if the results are reliable, can they be generalised and are they relevant.	L
17.	They don't teach many critical thinking skills.	L
18.	Film studies, you have to be able to read a film and pick certain bits out and say the significance of it.	Y
19.	In sociology, we will have class debates which is what critical thinking involves, to help solve a situation, or give our own opinions.	Y
20.	Not much at all. Other subjects would expect you to know and be able to use these skills in the subject. That is why some people drop out of subjects. They have an interest but are unable to cope with the work.	N
21.	Other subjects don't go to that extent. For example the least is power points to develop confidence. It is more work [subject] based than discussion based as anyone will be able to join to critical thinking, but others you will need to have the knowledge first.	N

N=no or negligible; Y=yes; L=limited (to specific subjects eg1,4,5,9 or in extent they do it eg 2,3,5 or in range of aspects covered eg8,10,16,17); Dis = disposition

Y=3 (all refer to specific subjects 2x Sociology & Media), N=7, L=13

Response 16 shows difficulty with question as says no then gives eg of yes (may reflect gauging against ct as they know it in all its various aspects)

Student Number	**6. Has studying critical thinking affected you in any ways beyond your course of study?** (please explain how)	
1.	Yes I can put forward a good argument when debating with family, friends etc.	A F
2.	Gave me more confidence to stand up and speak my view.	C
3.	Yes as it has enabled me to argue a lot better than previously. By finding errors on both sides of mine or another persons argument.	A
4.	Made me a tad more argumentative and more aggressive in my arguing, which often helps me win my arguments.	A dis
5.	At home when arguing with mum and she says ‘‘no because I’m your mum and I said so’’ makes me get my point across as she’s using an appeal to popularity.	A F
6.	Yes, studying critical thinking has made me opened minded and I have learnt skills that helps me in my work environment such as speaking on my behalf and putting my points across. Family and friends say I show more confidence in my speech and argument skills. So yes it has affected me.	Dis C A
7.	These skills have helped me to take a more logical approach in life and to think about actions before taking them.	Dis
8.	Yes, I have been able to make better conversations with family and friends because of this.	F
9.	Yes because the skills I’ve leant to debate with means that I will use them every time I have a debate.	A
10.	When arguing with parents etc.	A F
11.	At home and with friends it is easier to win arguments with people and to puck my arguments better, but also to see where people make mistakes and how to exploit these mistakes.	A F
12.	Critical thinking has helped me in everyday life. I now think before carrying out actions I have become a more confident + outgoing person. I analyse and interpret arguments + articles in papers. It has just made me a better person in	C A P

	general.	Disp
13.	Yes, the quality of arguments I have with people has improved because I no longer accept their conclusions from their reasoning so easily. And other times I can recognise the reliability of a source of information and decide whether it is plausible/believable. Also, I can see what people do to avoid saying things (e.g politicians) that they are asked, but they divert the attention away. Also, I can evaluate some peoples reasoning and come to a good conclusion about their argument and whether to accept it or not.	A Dis
14.	Yes, it has made me think more clearly about everything. I am able to argue more and be right as I can pick up on any flaws others have etc. It has probably made me more argumentative too as I tend to enjoy arguing with others.	P A Dis
15.	In a way yes because it certainly gets me into more arguments at home with my dad because I question him a lot. Secondly I question the news quite a lot and don't read certain news papers anymore because they talk a load of rubbish.	A F Dis
16.	Yes critical thinking has helped me to be able to construct a stronger argument to get my point/view across. It has also helped me to be able to pick apart opposing arguments and to highlight where they are going wrong.	A
17.	I pick flaws out of peoples arguments such as slippery slope, straw man etc and I use it to strengthen my arguments. Otherwise it hasn't really affected me that much.	A Not much
18.	Yes I don't always believe everything I hear. Its also given me a lot more self confidence to say what I think.	C Dis
19.	Yes it has because now if I want something I will put up a good debate/argument for my side. And also when reading things I question it more.	A Dis
20.	It has allowed me to put my opinions across effectively and at times fairly. Like I said, for me it is a discipline, effective when dealing with heavy workloads (essays).	A Means to end
21.	I am able to use it in the workplace not arguing just focusing on everything such as consequences.	Dec

A=argument; F=family & friends; C = confidence; Dis = disposition; Dec = decision making; All respond in the affirmative (though one says 'not much').

Appendix 3 NGT: sample question report East College group 2

1 Critical thinking skills are anything but critical. These are taught as a formulaic technique as prescriptive as teaching six year olds to memorise their tables.

Answers

A Strongly agree

B Agree

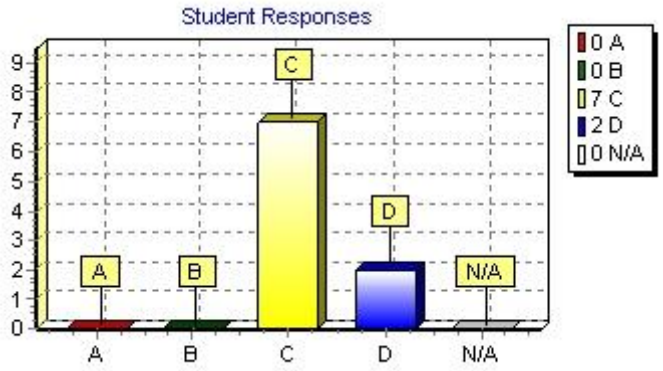
C Disagree

D Strongly disagree

Students	**A**	**B**	**C**	**D**
1, Student	-	-	-	D
10, Student	-	-	C	-
12, Student	-	-	C	-
13, Student	-	-	C	-
14, Student	-	-	C	-
2, Student	-	-	-	D
6, Student	-	-	C	-
7, Student	-	-	C	-
9, Student	-	-	C	-
Response	**0**	**0**	**78**	**22**

Percentages

Results



5 It requires only a relatively slight knowledge of any subject to be able to evaluate arguments relating to it oneself

Answers

A Strongly agree

B Agree

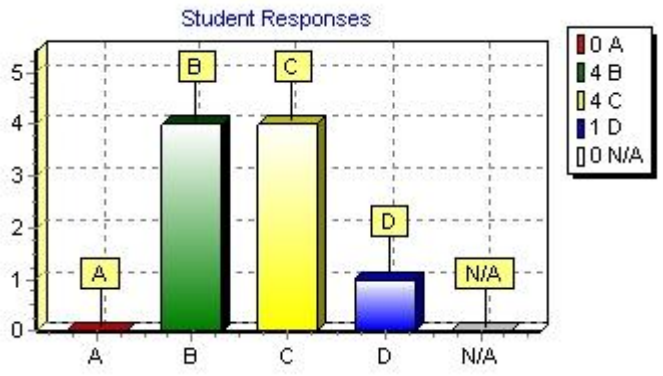
C Disagree

D Strongly disagree

Students	**A**	**B**	**C**	**D**
1, Student	-	-	C	-
10, Student	-	B	-	-
12, Student	-	B	-	-
13, Student	-	-	C	-
14, Student	-	B	-	-
2, Student	-	-	-	D
6, Student	-	B	-	-
7, Student	-	-	C	-
9, Student	-	-	C	-
Response	**0**	**44**	**44**	**11**

Percentages

Results



Appendix 4 Transcript of group discussion East College group 2

MH: that's the right top number [quote 1]…most of you seem to have disagreed with that…it's not just a set of standard exercises…standard drills…is that right? What more is there to it then? You've disagreed that CT skills are formulaic… what more is there to it?

St1: you've got to think about things

MH: you have to think about things, yeah…any more?

St2: its not just as simple as that either…there's a lot of things you have to consider to help you see things logically

MH: like?

St2: erm…I dunno just ...well I dunno

MH: its not just routine. Go on give me a flavour of that…what goes on that makes it more than that? Aren't you just doing standard exercises…find a flaw…find this…?

St3: but it can be used in like real life situations as well…like if you are given some information you can make a better decision if you …than if you hadn't had the knowledge of CT

MH: so you do something…you're not just going through a routine way of analysing something

St3: yeah you come to a better decision, more logical, with the knowledge of CT

MH: ok thank you…any other things?

St3: you can have with CT you can have multiple outcomes as such...it isn't… a lot of it is to do with perspective – how they see their arguments whereas teaching 6 year olds to memorise their tables they don't have any other answer than that that is it

MH: so there's a difference in that there's a fixed way of doing that or a fixed set of answers whereas there isn't

St3: yes teaching children to memorise their tables is synthetic truth whereas CT /?/

MH: ok, any other comments? Let's move on…this is about CT encouraging multiple points of view …all of you agreed with that…how does it do that, in what way does it encourage multiple perspectives? … you've all said you agree with it…

St4: you've got to be like open minded you have got to think about the other side of the argument and like so you can counter what they write so you need to understand it from both points of view to make an argument

MH: so you are not being led to a particular point of view necessarily and have a more informed way of choosing between them? move on. ..have come to that in last question as well…This one [quote 3] is CT is an academic competence akin to reading and writing is a little bit more split.. .but most of you agree that it's like reading and writing

St5: it's not so basic as they are there's a lot more different elements than /?/

MH: did you agree with it ?

St5: no

MH: you were one of the couple who disagreed

St5: its more basic its one of those things you use everyday I know you use CT everyday but its not like as basic

MH: Ok …a lot of you agreed that it IS LIKE a key skill like reading and writing. Can you tell me why did you agree with that? …somebody must have…

St6: I disagreed

MH: somebody who's agreed… tell me why you feel it IS like reading and writing?

St2: I think it's as important coz you are always going to have arguments…about stuff…it may not be as simple but it is as important

MH: so your response was agree and it was because you'd give it equivalent importance

St2: yes as part of that yes…not the same but equal importance…

MH: any other thoughts on getting…ok let's move on…

MH: This is the one 'our ultimate goal is…is to learn to evaluate arguments'…everybody seems to have agreed with that

St7: [whisper] I didn't, I didn't do it …

MH: why's that …unanimous?

St5: (laughs) that's what it is

MH: sorry? …that's what it is…is that what you spend all your time doing?

St5: A lot of it

MH: A lot of it…so from that point of view you can't argue with it

St5: it's part of the definition of it

MH: aha..it comes from one of the critical thinking textbooks that…. …moving on…

'creativity…plays an important part in CT…

St/Asst: you've missed one…you've missed out 'requires only a slight knowledge'

MH: sorry

Asst: so you did jump on one…that's it

MH: it requires only slight knowledge to evaluate arguments /?/…everyone's agreed with that …can you DO critical thinking adequately without. .erm.. specialist knowledge. It says you can do CT, you can evaluate things effectively with only a slight knowledge of what you're dealing with

St3: mm yeah in that …in the other day in the competition we had we were given the subjects (St?: on the day) half an hour before the arguments [debate?] we had…and we had to use the thinking skills in things we had no specialist knowledge about

MH: you're not involved in the preparation for the external debate are you?, I asked you that already…one of the titles for the external debate…the seen ones…is 'multiculturalism has failed' can you really get into a critical argument about that if you don't know anything much about multiculturalism? Politically or from a sociological point of view

St2: you can do it from experience maybe…like if you went to a certain school /?/ or if you come from a school where its white, then you can y'know you can do both sides

MH: you'd be able to apply those skills …using what resources and knowledge you've got?

St2: yeah

St3: you can always…or most of the time…erm…argue something even with a little knowledge . you just have to have it strong…the points strong…the reasoning

MH: you can still see whether things are reasoned well, whether there's flaws in argument even if you've only got slight knowledge?

St3: yeah

MH: is that the way you view it? I guess …there are some nods again and similar responses ..that's the view being taken…the next one's about creativity…'creativity plays an important part in CT, how?

St1: you've gotta kind of like… if you can't think of like the consequences and things of what you're arguing about…then what are you arguing FOR coz than erm after you've argued the point what would happen like right?

St7: yeah

MH: ok so you've got to have some ability to IMAGINE the consequences you said

St6: yeah, like your earlier one about multiculturalism what would happen if like all the cultures split...y'know..it'll be bad

MH: right … so that's creative in the sense of using your imagination…anybody answered positively on that in any other way that creativity plays a part?

St3: it's similar to like erm artists using their paints…they have a certain set … produce a certain set of skills in critical thinking you've got to use…it's how you use those in an argument or a real life situation…you'd be creative you might have examples but you might not use them coz they aren't strong enough

MH: so its like a palette to extend the analogy you are drawing from…or a repertoire…interesting…thankyou for your responses on that… moving on

Most of you disagreed…this is the one [quote 7] about put in an unenviable position if you have to assess arguments without the necessary information - most of you disagreed but

a few agreed with that. Someone who agreed with it could you tell me why you agreed with it? (14, 12, 16 who's that?) come on someone's got those

St7: James you've got that

St5: I've got 12, like in debate sometimes you are put on the side you don't agree with which is so you envy people who are actually on the side that you'd want to be on in the first place. (MH: right) so you're on the side you don't want to be on that's mainly based on that

MH: ok that's fine that's how you've interpreted it

St5: mm

St3: sometimes it's like the consequences…if there's bad consequences you are going to you might try and argue a point …

MH: Let me try and strip out the wording of this what this is getting at is that it makes it really awkward for you if you don't know enough about an area…its back to that question about 'can you do ct without the knowledge' (St?: oh 'penny drops') This quote is saying it makes it really difficult to try and do any sensible evaluation…critical assessment things if you don't have the specialist knowledge

St: it's just a challenge

MH: it's a challenge rather than an impossibility?

St: yeah

MH: do you think you can cope with most things…what about a bit of physics or…cosmology…or huh I don't know if you're given something from archaeology or something you didn't study in any shape or form

St3: you can't do anything without information in Physics like unless you're given like results or something you can't do anything but in critical thinking you can

MH: in terms of what you do, what you look at?

St3: yeah cos you know things like from experiences, your memories and your opinion

MH: that means you can cope with the stuff that you get in Critical Thinking because it may be general enough for anyone to have a basic grasp of at least

St4: and like Physics is like a.. it's there that is it deal with it because that's the data (MH: yeah) y'know if you get that from an experiment you can't just like well ' that cant be it' because that is it

MH: so in that example you wouldn't, would need to know more about…the ideas in Physics, the methods in Physics are quite hard [to disagree with] Let me press on to just one or two more…strong agreement on this one…that's the one about CT developing ability to interpret evaluate analyse arguments; that one comes from your exam board that quote and er not everybody's agreed with it…interestingly 'CT develops the ability to interpret analyse and evaluate ideas and arguments and can support thinking skills in ALL subject areas' Someone who disagreed can you tell me why you felt…on what did

you disagree, was it the applying skills across different subject areas that made you disagree?

St6: its basically just about applying it to Art the reason I disagreed I don't think you can apply it to Art when Art is just about expressing yourself not about [the action?] /?/

MH: is that something you do yourself?

St6: well that's my idea of Art I don't do any Art

MH: right so that's your idea of Art so you can't imagine how you could use it in that sort of area (st: yeah)…anyone else? Who else put disagree with that (10 or 8? Or 16? That was you was it? who's 10? (St: I pressed the wrong button)

MH: there isn't a right or wrong answer to these this is just to get your interpretation of what's been said. This one's about reasoning in a vacuum, it's pointless, it's the same theme you need to know substantially about an area to do anything effectively in terms of critical thinking…quite mixed response on that. Some of you agreed the a & b responses there…you've agreed with the idea that just doing CT in a vacuum is pointless. Do you feel you do that or not?

St2: I don't get what it means by doing it in a vacuum

MH: it means doing CT like YOU do it as a standalone subject rather than in the context of another subject ...doing CT just in a general way like you do it…what this quote is saying, they're treating that as if you are doing it in a vacuum…its not…in isolation from any particular subject material

St1: I do mine in a vacuum coz I do Physics chemistry and maths but its good coz you're learning skills and reasoning

MH: is it…Does it feel like you are working (diff st: you can apply it) in a vacuum as if it's just exercises for the sake of it?…that's what it's getting at

St1: no

MH: why not?

St1: well coz you can take what you learn from it and sort of and use it in other lessons and stuff so the subjects you can just argue you can just really talk about anything unless it's a really really specific subject like Physics coz you can't really say it's not coz it is sort of thing but like in Psychology and that like you can use all the stuff you know to look at is that true or is it not? (MH: right) if that makes sense

MH: so it doesn't feel as though it's in a vacuum coz you can see connections with it elsewhere, perhaps in some other subjects, in general life? Some of you nodding ...yeah… on that as well. Let me move on to the next quote it's the one about democracy, I'll be interested to hear that and I won't keep you much longer after that

A lot of you've said it IS essential to a healthy democracy –that's the quote. CT is crucial to creating and maintaining a healthy democracy

Someone else who hasn't spoken who said yes to that…anybody here? did you agree with it?

St7: its like if you get into an argument and you're keeping it in to yourself /?/

MH: and how do you connect that to the whole political thing about a healthy democracy, why's it so important to a healthy democracy?

St7: I don't know really (whispered)

MH: why do you need it…I'm just trying to get someone else to speak for a minute…

St3: democracy's about y'know the vote or the individual and their voting power and if people can understand the position where politicians come from they can make a just and informed decision about it so they know what people are talking about and why y'know they can make a the vote

MH: anyone else any other comment? What's the consequence if you don't have the ability to think critically? what's the downside?

St3: then how are you going to vote well? You won't know who to vote for you just think this guy sounds the same as anybody else I don't know what's the difference

MH: or you just go along with the one who has the best PR machine or something

St3: mm you might just like accept the point and be persuaded rather than question it

MH: so a questioning attitude you see as essential?

St3: yeah coz if you question it you begin to understand what it's about so…yeh

MH: ok that's great. I know you are all wanting to go and the other questions towards the end repeat some of the same themes like whether you need subject knowledge and so on…that's one of the things I was trying to get at…how you view that, coz there's quite a debate within the literature about critical thinking about whether you can teach it or whether you *should* teach it standalone rather or whether it should be buried into other subjects. What your answers suggest is you see a value to it as you're doing it which is as a standalone subject…that's the gist of it…thank you very much

Appendix 5 Teacher response task and sample response

Text of contact letter (following approach in person)

Dear Rachel

I am currently carrying out research towards a PhD with the University of Southampton. My area of interest includes a focus on higher level skills at A level. I would be very grateful if you could spend some time on the activity attached. I anticipate that this might take about 45 minutes. **Please return your comments on the attached form to my letter tray by Friday 8st July.**

As well as assisting with my research, I hope that the findings will be of value in discussions at the college concerning learning and student performance. I will be approaching a number of experienced teachers across a range of subject specialisms and once I have had the opportunity to analyse all the responses, I will disseminate the findings to participants.

Thank you for your assistance.

Mark Howarth

28th June 2011

Task instructions and sample response

Please read the article attached and describe what you would expect a high ability student in Biology to comment on if they were asked to write a critical evaluation of the piece (assume the student is close to the end of A2 in the subject). Please give an indication of both

i) The general kinds of things you would expect them to consider and

ii) Any specific aspects of the content of the piece you would expect to be discussed

Comments from a Biology perspective

Introduction-

In the Biology A-level course, this form of literary criticism is not something which students are asked to do, so I am unsure exactly what standard would be achieved. Students are asked to read and comment on experimental design, results and conclusions but from much shorter passages, tables and graphs and in a very structured (short-answer) way in the exam. They are expected to relate their knowledge to unfamiliar situations, draw valid conclusions and evaluate the methods and conclusions of others.

General aspects to consider

I would expect students to be able to consider who has written an article in the sense of likely sources of bias (research funded by an interested party for example). They are asked to comment on whether conclusions are justified from the evidence provided. They would be expected to recognise very sensationalist claims such as that expressed in the first sentence, and to query the justification for such a comment. They would I think be expected to distinguish wild speculation from established research.

Specific aspects of this piece to be discussed

This piece refers to a number of aspects of biology and of biotechnology which are studied on the course, such as evolution, cancer, genetic modification and stem cells. I would therefore expect them to explain what they already know about these processes and to evaluate whether it seems likely that such technologies will enable the developments outlined in the passage. Students would perhaps explain what they already know about cancer and its development and how it is treated as this is covered on their course, as an example of the development of the scientific method. They would also discuss the definition of a species as the opening statement suggests that this species will no longer exist. They should be familiar with ethical issues and the importance of legal controls over research in controversial areas such as reproductive technology. Students have also studied population trends and could comment on the demographic consequences of a rapid increase in life expectancy.

Some students may identify aspects of the language which are not used at A-level, e.g. ‘Darwinian’ evolution (prefix not normally required), ‘creatures’ (the biological term is organisms).

A-level Biology students are required to consider ethical issues during their course and so should be familiar with the arguments about enhancement (e.g. during gene therapy).

Appendix 6 Comparison of subject responses with Critical Thinking mark schemes

Comparison chart - Psychology

Features of critical evaluation identified by Psychology teacher	**Features of critical evaluation identified in CT markscheme – "Key points of flawed reasoning"**
	– conflation of terms genius, brilliance, success, achievement
	-confusion of necessary and sufficient conditions (re effect of hard work on promulgation of genius)
Contradiction noted in rejection of genetic determinism yet acceptance of environmental determinism	-inconsistency in noting some children are born brilliant yet suggesting overall that genius is not born and all can be great
	-lack of supporting examples showing non-brilliant children achieving genius type greatness
	misrepresentation (straw man) in suggesting those who support notion of inherited genius do not see hard work as necessary
Problematic nature of concepts and their measurement noted in relation to intelligence	-imprecise definitions eg 'brilliant learners'
Move from a correlation to a presumed cause and effect when there could be another variable that caused both [that could eg be innate brilliance]	-causal flaw in the claims about practising a musical instrument and expertise (combined with conflation of expertise with brilliance)
	-generalisation from one area of expert brilliance may not be warranted
	-appeal to authority of unidentified researchers
Knowledge context –issues linked to concepts and theories eg individual choice v. social determinism	

Comparison chart - Sociology

Features of critical evaluation identified by Sociology teacher	**Features of critical evaluation identified in CT markscheme Jan 2007 q23 evaluate the support given in para 2-6 to claim that 'the streets must be seen to be safe whatever the cost and however many sensitivities are bruised to make them so'…Flaws in the reasoning and their impact on the strength of the reasoning** **PLUS q24 move to conclude we have worst of both worlds (skimpy policing and intrusive monitoring)**
	– causal flaws –i)para 2 no evidence that lack of policing is the cause of increase in street robberies or that being safer at home is self financed alarm systems (police are blamed for one thing and not credited for the other) – lack of clarity on where responsibility for actions lies *But* doesn't deny support to 'need for streets to be seen to be safe' (for social cohesiveness etc)
	causal flaws –ii) para 6 ignores other causes of evil such as disaffection, selfishness (but writer doesn't claim exclusive cause)
	Straw person account of view of 'fortress' alternative but again doesn't alter validity of case for streets to be seen as safe
	generalisation from one area of 'failure' on crime to claim police are unsuccessful but again doesn't alter validity of case for streets to be seen as safe
	Assumption that problems growing as result of reduced policing (i.e. less to stop it?) rather than responsibility of those committing acts; similarly that its police's job to protect us rather than our own
	Supporting case given for why streets must be seen to be safe but not at any cost or at

	expense of bruising sensitivities
Expect “students to use methodological skills” to assess the types of data used e.g. “authenticity, credibility, reliability, validity”	Weaknesses in evidence cited e.g. no comparative stats for diff age groups; sources not always clear; also in citing stats on diff age groups or crimes than those under consideration
	False dichotomy introduced by Singapore example – we are left to see freedom as incompatible with strict controls
	Contradiction between claim that streets should be seen to be safe at all costs and argument that such measures encroach too much on freedoms
	Definition and examples used to show too restrictive measures eg DNA, ID cards – don’t affect freedom to act within law; databases not cards are invasive f privacy
	Assumes the strict punishments are the reason for Spores safe streets
Need “to locate the article in a wider social context. This would mean identifying the source, the headline (bias?), the date (how contemporary?)”	
Developed assessment of bias – personal, political “raising questions of power, wealth, social inequalities” [ie interests]; plus theoretical influences giving context to interpretations “Functionalist, Marxist, New Right, Feminist etc” and “Collectivism versus Individualism” Overall “I would expect to see a synoptic application of their sociological knowledge within a sustained evaluative answer”	

Comparison chart - Art

Features of critical evaluation identified by Art teacher	**Features of critical evaluation identified in CT markscheme – "Evaluate support for the claim…"**
Bold claims made without reference to sources	unsupported claim that great graffiti is worth having
	conflation of wall art with all art resulting in poor analogy of crimes of bad painting with graffiti as defacing property
Sweeping generalisation about all aerosol and art (in general) as 'feeble and weak'	possible unrepresentativeness of examples used
There should be discussion of terms 'artist' and 'vandal' as applied to Banksy's stencil work	definition issue – actually calling it art (not supported)
Poor analogy with fear of crime greater than actual and loathing of graffiti	poor analogy with fear of crime greater than actual and loathing of graffiti and incidence of it
	straw person – misrepresents Encam
Comparison with cave painting described as an erroneous appeal to history used to legitimize the argument	analogy with cave painting is misleading
Credibility of source questionable in terms of both lack of expertise and vested interests	
Use of knowledge of relevant art contexts and meanings is needed to judge the validity of the argument presented	

Comparison chart - Biology

Features of critical evaluation identified by Biology teacher	**Features of critical evaluation identified in CT markscheme – "Evaluate support for the claim…"**
	straw man representation of opponents to synthetic biology – visualising Frankenstein and later as Luddite rejection of technology
	appeal to tradition – history of enhancing ourselves
	assumption that new creature will be 'better' than humans
	restricts options – die out or accept our replacements (eg what about naturally evolving humankind?)
	unsupported opinion and recommendations resting on questionable assumptions
	flawed analogy between synthetic sunlight and synthetic biology
	Big 'if' in the hypothetical reasoning – if synthetic biology works – this begs the whole question
Imprecise terminology – creatures/organisms	
Issues of definition – what constitutes a species	
Consider possible bias or vested interests of the source	
Separate speculative from evidence based claims	
Application of knowledge needed to assess the plausibility of the claims made for the impact of biotechnology	

Appendix 7 Assessment objectives in sample subjects

All subjects in the sample include assessment objectives that require critical evaluation skills. In addition reference to critical evaluation skills is one of the factors which distinguishes performance description statements applied to higher assessment levels compared to lower levels. Assessment objectives refer explicitly to assessment of reasoning, evidence and methodology in the specifications for Psychology and Biology. The statement in the Sociology specification is more implicit, but similar in focus once the performance descriptors are considered. These three subjects appear to value skills that are most clearly aligned with those which make up the focus of Critical Thinking A level. Those for Art and Media studies appear to place more emphasis on application of knowledge with critical evaluation and understanding arising out of this, while in ICT evaluation is expected in the context of problem solving designs and projects.

Psychology (OCR 2010: 28-9, 40-41)

Assessment objective	**Performance descriptors (top and bottom of grade range)**
• analyse and evaluate scientific knowledge when presenting arguments and ideas; • assess the validity, reliability and credibility of scientific information; • analyse, interpret, explain and evaluate the methodology, results and impact of their own and others' experimental and investigative activities in a variety of ways.	A/B directly address the issue, showing effective analysis and evaluation when considering psychological theories, concepts, studies and research methods E/U partially address the issue, showing basic analysis and evaluation …as above A/B critically evaluate statements, conclusions or data E/U when directed, identify inconsistencies in conclusions or data A/B comment effectively on strengths, limitations and ethical issues in research design E/U as above but no 'effectively'

Sociology (OCR 2008: 37, 45-6)

Assessment objective	**Performance descriptors**
• Demonstrate skills of application, analysis, interpretation and evaluation as indicated in these specifications	A/B make some analysis and evaluation of evidence and arguments that have relevance to the question paper.

	E/U make a limited analysis and evaluation of evidence and arguments relevant to the question paper. A/B make detailed and accurate analysis and evaluation of sociological evidence and arguments on a variety of issues that are highly relevant to the question paper E/U make basic analysis and evaluation of evidence and arguments that have some relevance to the question paper

Art & Design (Art History) (OCR 2008: 42, 65)

Assessment objective	**Performance descriptors**
• Develop their ideas through sustained and focused investigations informed by contextual and other sources, demonstrating analytical and critical understanding. • Present a personal, informed and meaningful response demonstrating critical understanding, realising intentions and, where appropriate, making connections between visual, written, oral or other elements.	'Mature': convincingly selects and demonstrates a mature understanding of reviewing and refining ideas, successfully identifying and interpreting relationships. 'Basic': shows basic awareness in understanding with some refining of ideas. 'Mature': quality of language is perceptive and analytical fully aiding the recording process. 'Basic': quality of language starts to inform the recording process but is imprecise.

Media Studies (WJEC 2009: 9)

Assessment objective	**Performance descriptors**
• Demonstrate knowledge and understanding of media concepts, contexts and critical debates. • Apply knowledge and understanding when analysing media products and processes, and when evaluating their own practical work, to show how meanings and responses are created.	A/B create and sustain well-organised and coherent arguments linked to media contexts and critical debates E/U show some ability to develop arguments linked to media contexts or critical debates A/B produce a critical and reflective evaluation of the process and its outcomes. E/U produce a reflective evaluation of the process

Information and Communications Technology (OCR 2008: 35)

Assessment objective	Performance descriptors
• investigate and analyse a problem and produce a specification • evaluate solutions and their own performance	A/B the ability to design and implement a rigorous testing strategy using evaluation skills which analyse in depth their own performance and that of their solution E/U evaluation skills which analyse both their own performance and that of their solution.

Biology (AQA 2007: 46, 59-60)

Assessment objective	Performance descriptors
• analyse and evaluate scientific knowledge and processes • assess the validity, reliability and credibility of scientific information. • analyse, interpret, explain and evaluate the methodology, results and impact of their own and others' experimental and investigative activities in a variety of ways	A/B evaluate critically any statements, conclusions or data E/U identify, when directed, inconsistencies in conclusions or data A/B interpret, explain, evaluate and communicate the results of their own and others' experimental and investigative activities, in appropriate contexts E/U interpret, explain and communicate some of the results of their own and others' experimental and investigative activities, in appropriate contexts

Critical Thinking (OCR 2010)

Assessment objective	Performance descriptors
• Analyse critically the use of different kinds of reasoning in a wide range of contexts; • Evaluate critically the use of different kinds of reasoning in a wide range of contexts; • Develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.	A/B a) recognise and evaluate particular types of reasoning, using appropriate methods b) use terminology accurately to identify flawed/questionable reasoning, explaining precisely what is wrong c) recognise, articulate clearly and evaluate the impact of any assumptions on the argument d) evaluate critically and precisely the credibility of sources of evidence and the impact of their judgements on the

	persuasiveness/strength of the argument e) interpret and clarify, where appropriate, key terms and ideas, commenting on the impact of the lack of clarity on the argument and on the effect of the clarification E/U a) recognise and begin to evaluate particular types of reasoning, although methods used might be simple or not appropriate b) use some terminology to identify flawed/questionable reasoning, demonstrating some understanding of what is wrong c) recognise and begin to articulate assumptions, commenting in a simplistic way on the impact of the assumptions on the argument d) make sensible comments on the credibility of sources of evidence, without necessarily explaining the full impact of their comments on the persuasiveness/strength of the argument e) interpret and clarify terms and ideas, where appropriate

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