

AN INSTRUCTIONAL ANALYSIS OF THE ADVANCED LEVEL  
AND INTERNATIONAL BACCALAUREATE CURRICULA

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## Chapter 1

### STATEMENT OF THE PROBLEM AND METHOD OF INVESTIGATION

#### 1.1 INTRODUCTION

The debate about effective and efficient educational provision remains at the forefront of political agendas world wide. Governments seem intent on using education as the main engine of economic growth and many school systems show a move towards greater centralisation and 'accountability'. The English move towards greater government involvement has seen the introduction of an imposed national curriculum to age 16 and widespread pressure has been increasingly placed on the British government over the past decade to review its educational provision at sixteen. There have been strong demands to reform a system that has long been criticised as being too narrow and too specialised to be able to produce students capable of dealing with the complexity of change associated with a post industrial economic structure. The 16 to 18 qualification lacks breadth and fails to develop skills for the future, according to many influential commentators, reported upon by: Dearing (1996), The British Labour Party (1996), Department for Employment and Education (1997)(1998).

The current curriculum is electivist and voluntarist, not only in terms of subject composition, but also curriculum structure. Composition relates to the patterns of subject choices; which subjects are prioritised and perceived as important by schools and students alike or which subjects schools deem they have the resources to offer. *More pertinent to the issue of curriculum structure is whether there exists the flexibility to choose subjects solely in areas of personal strength, leading to a structure dominated by particular faculty choice.* In addition, whether there are subjects within the curriculum which are mandatory and must be studied by all students engaged in a particular curriculum. With the Advanced Level, schools and



colleges can decide what they offer, leaving the final choice to the student. Not surprisingly, any attempts to broaden the structure meet with little success because the historical and philosophical reasons for choosing a narrower range of courses have not been tackled. Despite the calls for change, in the main, the pressure of strong governmental lobbying for a broader curriculum, has had little effect. The post 16 years sector has seen a strongly entrenched reluctance to move away from the 'Advanced Level', due in part to a fear of dilution of standards, but with surprisingly little definitive research being completed on which to base this continuance. Many countries have made the decision to broaden their post-16 curricula; Scotland, New Zealand and Australia all emphasise the need to study a wider range of subjects. As far as curriculum composition is concerned, this does constitute 'breadth', however there is little to suggest that this 'compositional' breadth is complemented by 'structural' breadth. Mandatory subject choice is limited, with few common core subjects.

The International Baccalaureate Diploma is unique in that it facilitates the mandatory study of at least one from each of the following subject groups, literature, science, humanities and a second language. Mathematics and Theory of Knowledge must be studied by all students in the programme. The discussion regarding what constitutes a 'broad' curriculum is thus further complicated by the fact that a student can study a greater number of subjects under certain curricula, but these may not constitute a broader range in terms of subject composition. In this thesis, it is recognised that a curriculum of genuine 'breadth' will necessitate cross-curricular study across a range of subject disciplines.

Across many other countries, there are now searching questions being asked about the nature of schooling in general and more specifically, about the effectiveness of post-16 educational practices. The demanding, sometimes contradictory, educational action and decision making process has greatly affected the curriculum of England, Wales and Northern Ireland. In the past three years, these countries have seen a change in the basic structure of the Advanced Level (Curriculum 2000)

and by 2002, the criticisms of the new initiative to broaden the curriculum have mounted. Calls are being made for a 'baccalaureate-style' post-16 option, with the viewpoints expressed that wholesale reform is the only way forward.

Strong reservations regarding any changes have been expressed in many sectors, not least the university and higher education sector. A belief still seems to persist that other educational systems do not compare in qualitative terms and hence the pursuit of studies in depth remains a major priority, as evidenced in the way in which the Advanced Level defies attempts at change, despite Welsh and Scottish moves away from the narrower approach. The 'Advanced Level' as the 'Gold Standard' of educational achievement is a concept which has held firm for over 40 years, but the nature of educational change is most strongly influenced by economic and social change in general. Many of the most important changes in relation to the 'digital age', as they impact on schools and schooling, concern the nature of work and the relevance of 'knowledge' as a measure of educational attainment.

Economies become more influenced by global developments, continuing trends towards a larger tertiary sector emerge, with declines in primary and secondary sectors. Skill levels continue to rise, underpinned by a need for a workforce which understands and utilises technology. The demands made upon the curriculum change accordingly; as the process of change quickens, in-depth knowledge becomes less important, superseded by the need for flexibility and adaptability. In many ways it can be argued that most economies have sacrificed education as an exercise in stimulating intrinsic motivation in favour of systems which emphasise the extrinsic rewards, whether financial or based on status. This emphasis makes it easier to measure summative attainment and the teaching can develop along purely didactic lines as the students are forced into situations where they must take in knowledge as a necessary pre-requisite for examination success.

Education as a quest for understanding and meaning is an ideal advocated by various curricula; elementary education in particular advocates an holistic, enquiry driven approach and this has also been called for in middle school systems. In the

pre university years however, this is not a strong movement and the Advanced Level system is probably more limited than most. If education is a learning process that is inquiry driven, inter-disciplinary, integrated and based on explicit assumptions of interconnectedness, then subject choice should be a factor in overall understanding. The Theory of Knowledge course within the International Baccalaureate recognises that all knowledge is created within a cultural context and that 'facts' must be questioned. The Advanced Level curriculum also encourages high levels of critical analysis, but does not facilitate learning across academic disciplines and it makes only minimal attempts to empower students to understand the past, whilst trying to make sense of the present and future.

If education as a process is to be studied, the literature is vast. *This particular study is based around the salient issue of whether or not breadth is acknowledged to hinder or aid a student in his or her studies.* The study cannot possibly question educational effectiveness, except in small pockets, but it can draw limited conclusions, based mainly around accepted measures in quantitative and qualitative evidence. The opponents of holistic approaches all point to a superficiality of learning which takes place if 'skills' are emphasised over content understanding. Certainly, skills alone cannot compensate for a lack of knowledge in particular curriculum areas, but a compromise of breadth versus depth seems to have become more necessary as employment needs change. Whether the sacrifice of the latter in favour of the former has university repercussions remains the subject for this study.

It forms the paradox I wish to explore; universities fear the move towards a broader curriculum, yet such systems as the International Baccalaureate embrace this breadth and continue to supply British universities with undergraduates who excel. In many ways, it has been argued that they are better prepared, and achieve to a higher level, than their Advanced Level counterparts in the rigours and challenges of further study. Much of the past evidence is limited in nature, based on small samples and skewed by emotive differences of opinion. When the Dearing Report (1996) attempted to initiate discussion about the reform of Advanced Levels, such

was the opposition that discussion was abandoned. It would seem that the only reform to be considered is small scale, as evidenced by Curriculum 2000, but of utmost importance is the idea that perhaps the pursuit of study in depth is an educational concept which could be claimed to have been designed for the employment and higher education practices of the past. Likewise, as the nature of knowledge changes, perhaps it can be argued that study in depth will become even more highly valued as a means to aid technological understanding.

*Different perspectives on the purpose of education abound, but many commentators agree that sound educational practices imbue the student with critical awareness, both through depth and breadth. Superficial understanding across a broader range of subjects is as limiting as deeper understanding of a limited range, with no overview. Such viewpoints are evidenced in the work of Dewey(1909):*

*The profit of education is the ability it gives to make distinctions which penetrate below the surface....One knows that there is a difference between sound and sense, between what is empathic and what is distinctive, between what is conspicuous and what is important (104).*

More recently, Gardner (1991) commented:

*An important symptom of an emerging understanding is the capacity to represent a problem in a number of different ways and to approach its solution from varied vantage points; a single, rigid representation is unlikely to suffice (13).*

Compare these with the most frequent charge levelled at the Advanced Level system by Entwistle (1987):

*Most learners adopt a strategic approach to learning and seek to invest their efforts where it will be most productive. 'Surface' approaches to*

*learning, focused on reproducing what has been taught and read, are likely where the recall of information is perceived as being sufficiently rewarding (12).*

This is not to suggest that the International Baccalaureate Diploma incurs no criticism. Fitz-Gibbon and Vincent (1994:11) suggested that ‘hybrid’ curricula appeared to be easier in the hierarchy of subject difficulty.

The issue is a contentious one and to advocate the efficacy of one style of curriculum over another invites attack from all manner of past educational research projects. With the advance of brain and learning research, together with the changing needs of the economy however, the study is able to add a little more to an area of education which ostensibly has relied too much on emotive rhetoric, rather than reasoned, substantiated discussion.

## 1.2. STATEMENT OF THE PROBLEM

### 1.2.1 Background to the problem

The debate about post -16 provision in England has always been a contentious one, having its roots firmly embedded in the ancient Greek belief of an educated elite that ruled the masses. Any preparation for higher education was necessarily specialised and limited. From this concept grew the idea of the Advanced Level qualification. However, criticism of the system has continued to arise, blamed for keeping the curriculum too narrowly academic in particular spectrums of the subject mix and, for the purposes of student learning styles, allowing little opportunity for self- expression and the opportunity to learn to view the world holistically.

Teaching styles too have been said to suffer from a content-led didactic approach, based on limited high stakes examinations, with little emphasis on the cross curricular nature of understanding. A Labour Party publication (author unnamed), *Aiming Higher* (1996:1) stated:

*“It cannot be sensible for some of our brightest young people to achieve excellent A Levels at 18, and still not be in any sense, well educated”.*

The English belief in devaluing qualifications which are said not to pursue knowledge to a great depth has had severe effects on participation rates within all spheres of post -16 education, thereby producing an under- educated and under-skilled workforce (until the 1990's, Higher Education participation of the British population never exceeded 25%, according to the Department of Education and Employment statistics 1997). The present target rate for 2005 is for this figure to have risen to 50%. According to Edwards, Fitz-Gibbon, Hardman, Haywood and Meagher (1997) it has always been assumed that an able minority are best prepared for high status occupations by studying a few academic subjects in depth. An increase in post-16 participation rates has been evident over the past twenty years, but an argument remains: whether this type of curriculum is an effective provider of

high calibre, well-prepared undergraduates for the Britain's Higher Education system. The Labour Party (1996: 4) expressed this idea:

*“Breadth is a sounder preparation than narrow specialisation for progression into higher education, employment and active citizenship”.*

The contrast with a system such as the International Baccalaureate could hardly be greater. The emphasis on the study of a much wider range of subjects within the Baccalaureate does stimulate the criticism that it does not constitute depth of learning. What has not been quantified however, is the experience's contribution to learning which allows much greater transferability of skills and the kind of learning which underpins knowledge through conceptual understanding. The large amounts of brain research completed through the latter half of the twentieth century, point towards the concept of ‘relevance’ as being the most vital component in deeper understanding.

Many educationalists now insist that the breadth of study is one way in which ‘relevance’ is stimulated by the links seen across the curriculum. In addition, the levels of less quantifiable skills of self- reliance and initiative must be studied from a qualitative viewpoint and they are no less important than the ‘academic’.

Educational research and theories of learning do seem to suggest strongly that the search for meaning is easier if conceptual stimulation occurs in a wider range of information input. Isolated subjects, requiring subject specific facts and skills create a barrier to effective learning, as patterning allows use of the spatial memory, the most efficient part of the brain in the learning process (Caine and Caine 1991).

The object of this dissertation is to offer an attempt to judge the merits of a system which values depth in the study of a limited number of subjects (usually in the same discipline) as opposed to a mandatory study of more subjects across the disciplines; in effect a clash of two educational philosophical ideals. The dissertation seeks to offer an instructional analysis of the two curricula, and implicit in this study are questions underpinning the role of education: generic questions such as "which

knowledge is of most worth?" or " how do human beings learn best?" or " what best prepares an eighteen year old for higher education?" are embodied in the context of this curricula comparison. Such major issues are obviously beyond the scope of such a limited study (see chapter 7), but can add to later larger scale studies.

Comparative pedagogic practices in each of the curricula are largely undocumented; the differences and/or the similarities in the organisation and process of students' learning have not been closely scrutinised with direct reference to each other. Given the massive costs of education in the British national system, it is noteworthy that calls for a 'baccalaureate' type breadth have been largely ignored, but with little empirical evidence on which to base the existing conservative approach. More recently the newly formed Welsh parliament has put forward plans for a pilot 'Welsh Baccalaureate', embodying the idea of a wider curriculum base.

In *Beyond the Border* (2000) the Institute of Welsh Affairs stated:

*A Levels have served us well but perhaps failed to deliver the broader base now required by many young people whose careers are likely to be multi-streamed. A Levels have not been immutable, both the context and method of examination have changed substantially within the last decade (11).*

This concept has met with widespread approval in Wales and the curriculum will be piloted in 2003/2004.

Equating the two curricula is an extremely difficult process based purely on grades, for whilst they are both externally examined curricula, the aims and objectives of each are different, and in many cases the different assessment criteria could easily result in examiner bias and misunderstanding. For the purposes of this study it is intended to start with a statement of the problem and then use a combination of quantitative and qualitative methodology to arrive at a conclusion. There is no definitive or final answer to the problem statement and this is



acknowledged from the beginning; a series of smaller scale studies will help to triangulate an answer to the hypothesis, but this will necessarily be limited due to the macro nature of all curriculum study. As Cohen and Manion (2000) explain:

*Although we are some way from no longer needing to record the fall of every apple, as Peter Medway described it when speaking of the need for Science to be progressively relieved of the burden of singular instances, and thereby making more general statements of wider exploratory power; this need not discourage us from pursuing the quest with full vigour. Educational research will thus continue to have a central role to play in throwing light on all aspects of the learning process (Authors' note, pxxi).*

Even as this Thesis was being written, the British government was in the process of changing the format of the Advanced Level qualification and making the study of more subjects over the two years possible. However this seems to have changed little regarding the basic premise of the dissertation, as initial research indicates widespread dissatisfaction with the new approach and little real impetus towards a broader, 'baccalaureate' combination of A and AS level subjects. The supplementary AS failed to broaden Advanced Level study because of low take up and the need to concentrate efforts on perceived 'stronger' areas of study because the points qualifications system for university makes no allowances for the 'breadth factor'. Further efforts to include 'key skills, such as numeracy and literacy' components, in the Advanced Level curriculum also met with little success as many universities failed to recognise their value and made no provision for them in their entry level requirements. (IOE 1997). In supporting the Institute of Employer's criticism, a TES report (21/03/03) commented:

*Replacing A Levels with As and A2s has failed to broaden students' education and narrowed teaching within subjects. Very few schools and colleges required students to pick contrasting A2 subjects and many chose a narrow suite such as related sciences (3).*

The Financial Times leader column (24/2/2002) summarised the discussion:

*Under the Advanced Level system, 16 year olds specialise in three (occasionally four) subjects. And they can be any three subjects. But who can argue that Media Studies, Sociology and Art constitute a sound education in the final years of school? A valid Advanced Level system can include no literature, no foreign language, no science and no maths. Many students avoid 'hard' subjects in order to obtain better grades and so get into a university of their choice(11).*

The origins of this study lie in a report published in 1997, which highlights the lack of information and research available on a curriculum comparison basis. When the Institute of Welsh Affairs (1997) was studying the issue of breadth for their new qualification, the Welshbac, they attempted to address the issue:

*Since the early 1970's, thousands of students with International Baccalaureate qualifications have entered universities in Britain in all possible disciplines, from the specialist faculties of medicine, engineering, law and languages to the broader programmes of business and the Humanities. The most competitive universities such as Oxford, Cambridge, London, Durham and Bristol have featured strongly in the annual acceptance list. Feedback from these universities has been enthusiastic (7).*

Whether these universities perceive their International Baccalaureate students as typical representatives of a system of study in breadth, or merely as the most academically able of their cohort does have relevance to the study. If it is the latter, then this may explain why many universities still see the Advanced Level as an optimum university entry qualification and oppose its abolition. If it is the former, then why are universities clinging onto the need to retain Advanced Levels,

particularly as they have the necessary evidence that International Baccalaureate students handle the demands of Higher Education very well?

*The study will attempt to establish that curriculum content in the case of this instructional analysis assumes less importance than curriculum structure.* The whole thrust of the discussion will link learning theory to curriculum structure, incorporating subject specialisation. The Science student, to take one small example, will concentrate on the combination of subjects within that faculty because that is what the system demands; from the timetabling in faculty blocks in schools and colleges, right through to the points system employed by universities, the English system exerts an inexorable pressure which resists breadth and risk taking in favour of narrowness and safety in a limited number of like subjects. Fit-Gibbon (1997).

Piaget, writing shortly after the First World War, advocated a system of schooling which remained as broad as possible for as long as possible (1949, reprinted in 1972:71). This was in direct opposition to many of the universities, who feared for the academic abilities of their intakes, a fear, which resulted in a much-diluted Dearing Report (1996). The significance of this was that the Report had been vaunted as the springboard for educational reform to take England and Northern Ireland into the next century. The result of its failure at effectively reforming the post -16 structure seems to have been based purely on emotive reasoning. Despite widespread research, there is little evidence that Dearing commissioned any study which discussed the pedagogic rationale for retention of the 'Gold Standard' Advanced Level, albeit with a small-scale reform effort.

The implications of this are significant in the context of this study. If opposition to reform is so deep-rooted that there is no need to use research on teaching and learning to support retention of Advanced Levels, it bodes ill for possible future changes. Established educational theory and practice remains a major dominant

force in post-16 English education and this institutional immobility may yet prevent developments in curriculum thinking.

#### 1.2.11 Formulation (statement) of the problem

Given the amounts of investment in the 16-18 education sector and political pressure for a flexible, well qualified workforce, this thesis discusses whether the Advanced Level system remains the optimum means of ensuring that British university undergraduates have a more comprehensive level of subject understanding and a more effective grasp of the learning process than their International Baccalaureate counter- parts.

*The aim is to critically analyse, compare, and evaluate the relationship between two curriculum models and their users, namely students and teachers/university personnel.* It is intended to establish a link into respective levels of attainment through the study of summative examinations and assessment methodologies and profiles of teaching and learning in the two systems, leading onto comparative studies within Higher Education.

### 1.3 CLARIFICATION OF CONCEPTS

#### 1.3.1 Curriculum

In the context of this study, curriculum is the collection of subjects included in a course of study. In the Collins English Dictionary (1979: 390), curriculum is described as “*a list of all the courses of study offered by a school or college*”, originating from the latin *currere*, to run. This is simplistic in the context of this study, because the term encompasses much more than merely what courses a school or college runs; linked to the terminology must be the curriculum structure that governs the choices of these subjects, as many combinations are restricted by dictums from the respective examination boards, by a particular school's financial resources, or staffing expertise and suchlike. The rigidity of the framework of choice of subject study at 16 is a major factor in this study: on the one hand, the Advanced Level choices are made entirely by the student, in discussion with parents and teachers. The number of subjects, which can be studied, is the only constraint applied by the Advanced Level examining boards, and as we shall discuss later in the study, this principle has been relaxed since 2000, but there remains no mandatory breadth. On the other hand, the International Baccalaureate Organisation specifies mandatory discipline coverage in order that a student can qualify for the Diploma. International Baccalaureate Diploma students must study two languages (and can opt for three), they must study Mathematics, a Science (applied or pure), and at least one Humanities subject. In addition they can opt for a subject from the creative or performing arts. Factors that also set the International Baccalaureate apart from its Advanced Level competitor is the requirement that all IB students study a philosophy-based course named Theory of Knowledge (TOK), complete an extended essay of 4000 words on a study of their choice, and take part in Creativity, Action and Service (CAS), whereby all students must become involved in projects that benefit the community, and in doing so become more ‘rounded’ students.

As the two curricula in this study are discussed, it is important to bear in mind that the 'depth versus breadth' argument does not only apply to the number of subjects a student may take within the auspices of the respective curricula. The issue of mandatory coverage of the disciplines also greatly affects the direction of this study. As an example of this it is possible to highlight a case; should the Advanced Level curriculum allow the study of a greater number of subjects (as has recently been developing), it would still be possible for a student to remain within one or two subject faculties. Hence the issue of curriculum does not only apply to number of subjects, but also the composition of those subject choice groups and the overall structure of the curriculum which governs the subject options.

### 1.3.2 Advanced Level Curriculum (General Certificate of Education Advanced Level).

*“The GCE Advanced Level examinations are intended primarily as a preparation for higher education”* ( HMSO, 1995: 12). Students, usually aged 16, take three main subjects; these are examined after two years and, combined with coursework grades (maximum 20% in most subjects), a grade A to E is achieved. Some exceptional students can study an extra subject, and a 'General Studies' course is an optional extra for all students. Some universities will accept General Studies as an extra qualification. The addition of AS levels in 2001 means that students can now take one or two extra subjects after their first year of the course, but most evidence points to the fact that the ‘high stakes’ nature of the examinations, allied to the fact that choice of subjects is purely at the students’ discretion, means that reversion back to the ‘strongest’ subjects is common, as was highlighted earlier.

The format of A Levels, namely a collection of separate academic subjects means that choice of subject is voluntary, breadth may be desirable (HMSO 1995: 34) but is not required. The benefits of making cross curricular links are not evident in many cases as studies show that most A level Students do not cross the science/ art divide. The students are essentially caught in a system which values academic learning for its own sake but does little to help them appreciate what is happening in other areas of the curriculum and, in many ways, can be said to be detached from relevance in everyday life. Holmes and MacClean (1989) suggest that Plato's 'Essentialism' was the philosophy underpinning the A Level system. As a theory this maintains the idea that ideas and skills, fundamental to the prevailing culture, should be taught by the ‘master’ through traditional methods. During the twentieth century the curriculum of liberal education has been restricted to the principle of developing an elite who could lead with wisdom imbued by an education through the classics. They continue this theme by pointing to the failure of Mathematics and Sciences to compete in a country where moral values were gained through the study of selected subjects to a great depth.



The fact that A Level still embodies this essentialist, liberalist tradition by limited study of three (usually cognate) subjects is supported by universities which demand 'good' A level passes but put almost no emphasis on the much broader based GCSE examinations at age 16. This is mainly because, unlike the broader based American system, English universities retain study of very specialised degree disciplines (although there are some exceptions to this).

*Table 1.1 Advanced level Specialism by Subject*

|                                         | Female % | Male % | Total % |
|-----------------------------------------|----------|--------|---------|
| Science and maths only                  | 11       | 25     | 17      |
| Social Sciences only                    | 4        | 6      | 4       |
| Arts subjects only                      | 10       | 3      | 7       |
| Social Sciences and Arts only           | 39       | 23     | 32      |
| Non Specialised Science and non Science | 37       | 43     | 40      |

• *Department for Education and Employment Statistics of Education 1999*

These figures highlight the low number (only 40%) of students who passed three or more Advanced Levels, who crossed the Science/Maths and Arts /Social Studies 'divide'. Other interesting anomalies which are highlighted, though not possible to study further within the confines of this study, are the very low number of females who choose to drop Science and Maths choice at age 16. The fact that over twice as many males in percentage terms opt for this subject combination seems to have serious implications for curriculum planners in the UK. Effectively, the Advanced Level curriculum provides a gender mix totally at odds with research on this topic which seems to suggest subject choice is based on perceptions of attractiveness, rather than academic prowess. This gender imbalance may constitute waste of resources, yet aside from active marketing campaigns by Science and Mathematics faculties; the Advanced Level structure offers no solutions at the present time

Possibly because of this specialisation, the Advanced Level has seen little change since its inception. Edwards (1997:16) claims that:

*"A Level remains essentially what it was...in 1951".*

The claim has validity; despite rapidly increasing school retention rates to 18, the bulk of A Level numbers are taken up by the 'pure' subjects. This student specialisation, usually in a similar, or the same discipline, hinders trans-disciplinary skills development and could be claimed to encourage the acquisition of knowledge for its own sake, or for more extrinsic motivations. Edwards (1997:17) terms this *"deferred vocationalism"*, whereby students may not see the relevance or application possibilities to what they are studying, and they may even have little interest in the inherent knowledge and understanding being accredited, but they do recognise the qualification for its exchange value in terms of employment or university placement.

Whether this leads to a graduate of the system who has an unnecessarily narrower outlook or skills repertoire requires further study. Other bodies point to the fact that the Advanced Levels need reform; the Further Education Unit (1992) rejected the conventional boundaries between 'arts' and 'Sciences' as restrictive of a culture which must cope with change. It called for new study combinations that encouraged flexibility and innovation. A report from the Institute of Welsh Affairs (2000) called for similar reform, albeit linked more to a broader range of subjects to be offered, rather than new trans-disciplinary combinations. This is discussed in the literature synthesis later in the study.

Resistance to Advanced Level changes continues to be strong. In the Times Educational Supplement (19/2/99:29) the leader column stated:

*“The evidence clearly indicates that firms are not currently interested in hiring and paying for individuals who have a broader educational background.. broader is not necessarily better”.*

The perception that Advanced Level reform will entail a reduction in academic standards is common and the Advanced Level system retains fierce support. When minor changes were made in September 1999, in an attempt to broaden subject choice, opposition was vehement: *“critics fear ‘dumbing down’ of gold standard”* and *“ministers under fire for A Level reforms”* (TES, 19/2/99:26).

Perhaps the key to understanding the Advanced Level debate lies in its supposed relationship with ‘essentialism’. If the A Level curriculum promotes learning imbued with the ideas and skills fundamental to the prevailing culture, can it then not be claimed that its inception was almost fifty years ago and that society/ culture has undergone widespread change, with little development in curriculum. If educational practices have continued along perceived ‘antiquated’ lines then transmission of knowledge has remained a primary objective, as set out by Plato in his ‘master/student’ relationship. The ‘liberal’ influences which followed sought to empower the development of humankind through education in the Arts, however it retained a narrow educational perspective, even resulting in science losing much of its educational importance.

Universities and other interested parties maintain their resistance to a broader based curriculum partly out of self interest, but what this dissertation will attempt to show is that intake of students who follow such a curriculum cope just as well, and in many cases even better, than their more specialised counterparts.

Taking account of the wide disparity in numbers of students from each of the respective curricula is probably one of the major problems associated with proving the above hypothesis. However, extensive cross- referencing through the study does

help to raise serious discussion points regarding the explicit student cohort comparison in the hypothesis.

### 1.3.3 International Baccalaureate Curriculum

When the idea of a broad international curriculum was first mooted in the early 1960's, the first objective was to ensure that it fulfilled worldwide university requirements as effectively as possible. In 1964 The Twentieth Century Fund offered ISES, the forerunner of the International Baccalaureate organisation, 75,000 British pounds to investigate the feasibility of an international university entrance examination (Petersen 1987).

*What resulted was a broad based curriculum; students take six subjects, including Mathematics, Science, a modern foreign language and one of the Humanities. In addition students must study a philosophy based course, titled Theory of Knowledge, undertake a piece of independent research, culminating in an essay of 4000 words, and spend up to 150 hours involved in 'creativity, action and service' (CAS) (20).*

The structure of the International Baccalaureate Diploma has its origins in different educational philosophies. From the encyclopaedism of Comenius comes the International Baccalaureate's driving force. At the start of the sixteenth century momentum built for an education, sufficiently wide to include a wide spectrum of human knowledge. From the French revolutionaries came the idea that populations should not be divided into ruled and ruler by virtue of educational specialisation, but rather that a broad curriculum should provide a populace with a rationale for decision making. This ideology did seem to lose much of its impetus through the twentieth century in France as the Sciences and Mathematics dominated the curriculum, but the principles of Encyclopaedism were formed. The impact of essentialism is perhaps not as great but is shown in the division of all Baccalaureate subjects into 'higher' and 'standard' levels. The concept of greater depth indicated a willingness to show the English universities in particular that the qualification was not a superficial one.

If Plato's influence is the underpinning of the Advanced Level system, then the Diploma's philosophical foundations in encyclopaedism were plain;  
*“Essentially the transmission of knowledge or information and general education (over) a wide range of subject areas”* (Petersen, 1987: 40).

However, the main flaw in this 18<sup>th</sup> century European educational ideal was also recognised by the founders of the Baccalaureate; it can be seen to lead to a superficial memorisation of facts, transmitted from teacher to student, something which the Diploma's founders were keen to avoid. Instead, what the International Baccalaureate Diploma demanded was the development of *"ways of thinking and learn to learn"*, according to Pettersen (1987: 41). With the inclusion of Theory of Knowledge as a pre- requisite course on all Diplomas, students are encouraged to see the inter-connectedness of disciplines, to recognise the relevance of learning each subject in the context of broader fundamental structures in a vast field of knowledge. The inclusion of Theory of Knowledge, together with the mandatory study of subjects across a variety of disciplines, are the most obvious differences between the two curricula. It remains to be proven whether these particular features have an impact on the teaching and learning taking place.

The IBO mission Statement is a grand one:

*The International Baccalaureate Organisation aims to assist schools in their endeavours to develop the individual talents of young people and teach them to relate the experience of the classroom to the realities of the world outside. Beyond intellectual rigour and high academic standards, strong emphasis is placed on the ideals of international understanding and responsible citizenship, to the end that IB students may become critical and passionate thinkers, lifelong learners and informed participants in local and world affairs, conscious of the shared humanity that binds all people together while respecting the variety of cultures and attitudes that makes for the richness of life (IBO 2002).*

Such a mission statement is ambitious, arguably to the point of idealism, but importantly, it is supported by a qualification which fulfils the practical needs of British universities. As much anecdotal evidence shows, many universities are extremely satisfied with the preparation of their undergraduates from the International Baccalaureate system. However, quantitative evidence is severely lacking and qualitative evidence for this faith in the Diploma system is also difficult to find.

The mission statement does not make direct reference to breadth of study, but it links strongly to the earlier points made about changing economic and social patterns. The influence of the global economy, the need to encourage flexibility and adaptability through lifelong learning are both major strands of the 'digital age'. Although there is little definitive information we can take from this mission statement, the salient point is that it does make valid connections to the future. Advanced Level examination boards do not; Advanced Levels are a means to an end and there is little in the mission statements of the Advanced Level examining boards which suggests that they are aware of the needs of a new global economy.

The OCR Examining Board have no mission statement for public access, but the Cambridge Examining Board website (2002:1-homepage) states its mission: *"To advance educational standards for the benefit of individual students and the wider community"*.

Clearly, fundamental differences exist in philosophical terms between the two curricula. General education has been largely left untouched by the Advanced Level, except for a superficial inclusion of General Studies as an extra examination in the early 1970's. This subject has been shown to occupy less than 20% of class contact time in most schools, with little emphasis on private study (A.D.C Petersen 1973: 35) This time constraint has been stretched further by increasing enrolment and wider subject choice. Curriculum 2000, an attempt to broaden Advanced Level study, will conceivably cause General Studies to disappear from many schools as

resources and time allocation will be given over to the mandatory extra AS subject. Most student statistics point to a narrow Science/ Classics/ language concentration. As the earlier figures showed, only 40% of students in the Advanced Level system cross the Science/ Mathematics and Arts/Social Studies boundary.

The table does not show what combination of subjects are taken in Advanced Level, however it can be safely said that the International Baccalaureate mandatory coverage of Mathematics, a Science, two languages and a Humanities, is not a common combination. The specific programme requirements of The International Baccalaureate Diploma were born of efforts to establish a common curriculum and university entry for international students moving from country to country. In addition to this practical consideration was an idealistic vision:

*“Students should share an academic experience that would emphasise critical thinking, intercultural understanding and exposure to a variety of points of view”.*(IBO 2000: 2)

Resistance to the broader curriculum on offer to International Baccalaureate students does exist, mainly based on a belief that 'broader' must necessarily mean 'shallower' and more superficial. When the Welsh Development Agency (2000) commissioned a study of the desirability of a 'baccalaureate' type curriculum for Wales, over 40% of the respondents in universities expressed fears that the new curriculum, based on the International Baccalaureate Diploma (and using its examination papers for the first three years) would mean a loss of 'rigour'.

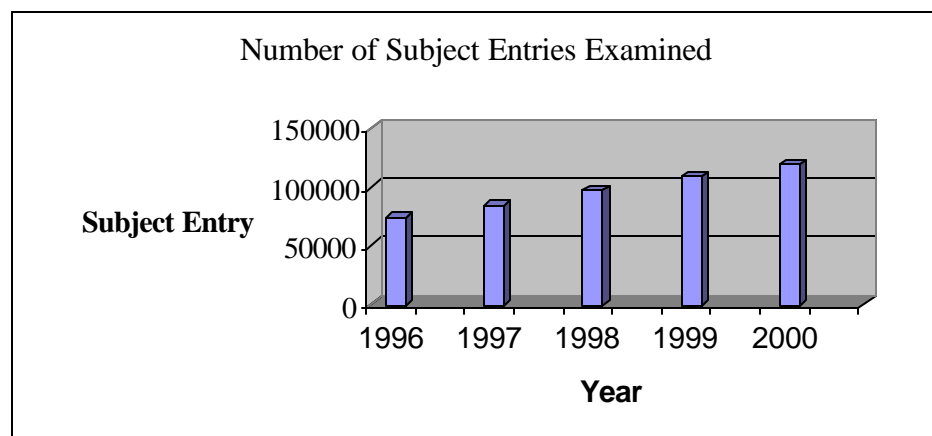
The debate over the qualification has not affected its strong growth patterns, with a 10% growth in number of candidates examined, between 1999 to 2000 (see figures below, taken from the IBO website). Over 1000 schools now offer the Diploma. Figures 1.1 and 1.2 below, with figures taken from the IBO's statistics booklet (2000:12), highlight the rapid growth in the International Baccalaureate Diploma.



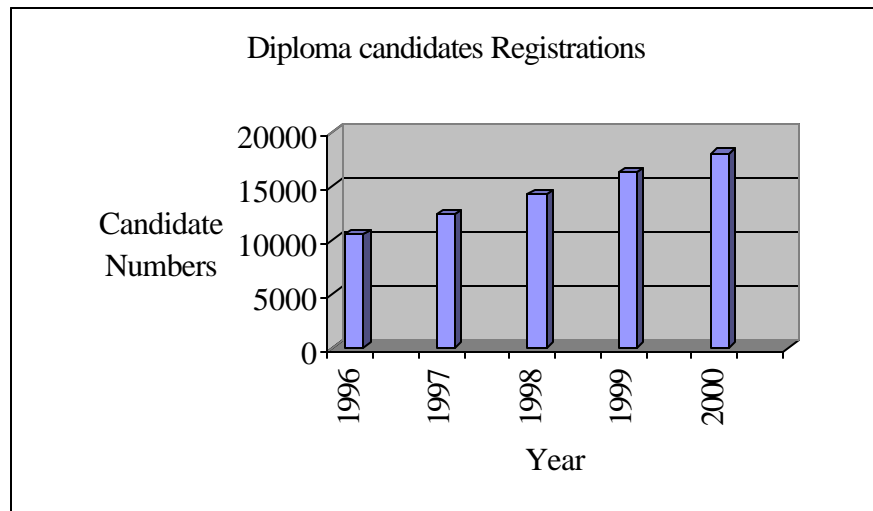
Considering its costs (almost 5 times that of the Advanced Levels), the Diploma has now established itself as a competitor to national systems world wide. The United States remains its largest growth area, with a 2000% increase in member schools over the past ten years. The International Baccalaureate Organisation's latest publication (2002) claims:

*In the years since its founding, the Diploma Programme has become a leading, internationally recognised pre-university qualification. Now it is a symbol of academic excellence worldwide. The student who satisfies its demands demonstrates a strong commitment to learning, both in terms of the mastery of subject content and in the development of wide-ranging skills. He or she is also encouraged to appreciate the universal value of human diversity and its legitimate boundaries, whilst at the same time understanding the common humanity which we all share (2).*

*Figure 1.1 Number of International Baccalaureate Subject Entries*



*Figure 1.2 IB Registration growth rate*



Also exhibiting steady growth patterns is the numbers of subject registrations; these are consistent across all the discipline areas-First Language, Second Language, Humanities, Mathematics, Sciences and the Arts. In the Advanced Level, the subjects commonly perceived as more difficult are losing candidate registrations as students choose their 'easiest' route to university.

What stimulates these growth patterns remains a matter of debate as there are no studies into the attractions of the Diploma Programme. One area certainly stimulates the highest levels of university appreciation, as can be seen later in the study; namely Theory of Knowledge. This is an interdisciplinary requirement, intended to stimulate critical reflection on knowledge.

This area of the International Baccalaureate curriculum seems to act as a 'glue' (IBO terminology) to the experiences gained inside and outside the classroom. The

origins of TOK seem to lie in a fusion of two distinct traditions; one is the pragmatic origin of how knowledge is used in everyday education, and the other is the study of philosophy. According to the subject guide ( IBO 2002) it is possible to have informed discussions about the nature and purposes, strengths and limitations of particular knowledge systems, with reference to classroom life.

*Students are helped to consider how they know what they know (different types of 'knowing') and to develop habits of reflection which they bring to each subject, resulting in a deeper intellectual experience. As befits an international programme, the TOK course explores various cultural traditions and encourages students to think about the strengths and limitations of different ways of knowing (5).*

Whilst the research remains limited, the effect of Theory of Knowledge experience on student approach, is difficult to quantify. As the study will show, without extensive pre and post psychometric testing, the Diploma experience is a combination of variables, difficult to separate, in the search for which 'differences' are most valuable to a student as they approach higher education. The arguments about rigour have persisted for the past two decades, with many 'conservatives' attacking initiatives such as Theory of Knowledge as a diversion from the study of 'pure' subjects.

The International Baccalaureate Diploma curriculum will continue to attract its critics. It can be assumed that the doubts and fears regarding loss of 'rigour' through study in breadth, apply in many academic circles.

## 1.4. METHOD OF INVESTIGATION

### 1.4.1 Literature study

Whether these philosophical differences lead to pedagogical differences and discernible different qualities in students from each respective curriculum, will attempt to be determined by this study. Surprisingly, there is little precedent. Much has been written on the merits and de-merits of each curriculum, but there has been no serious attempt to compare and contrast them, either qualitatively or quantitatively. Statistical examination comparisons with the International Baccalaureate Diploma have not been attempted since the early 1970's, as explained by Fox (1998):

*Comparability studies conducted in 1970 and 1971(indicate) that there were positive correlations between International Baccalaureate and national examinations in the limited aspects susceptible to statistical manipulation (34).*

The original studies were conducted when the International Baccalaureate had premises at Oxford University and, after contacting the IB archives, it appears that this study is now missing, possibly a transit problem caused by the move to the premises of Bath University in 1978. One article provides a basis for further work on university entrance by holders of the International Baccalaureate Diploma. Thomas (1988) comments on the:

*Extremely low levels of withdrawals or transfers, with no-one actually recorded as failing in the North American Higher Education system... One can discern major characteristics that would seem to be the hallmark of International Baccalaureate Diploma students: there is a high degree of persistence, with nearly all diploma holders attaining degrees and a majority continuing further (12).*

The basis for these comments is not pursued within the article itself, but it does help in the formulation of questionnaires. After a thorough search of ERIC there are many separate references to studies of the Advanced Level and the International Baccalaureate Diploma curricula, but no combination studies, as far as research conducted ascertained. In addition, the Australian Education Index failed to yield any studies, as did the British Education Index. Other potential sources were searched, including The US Department of Education (GEM) and the English Department for Education sites. There were also no viable studies mentioned in Dissertation Abstracts International. With little to base any research on, discussions with promoter and colleagues yielded some basis for further work.

The comparative nature of the study does present difficulties, particularly as one of the curricula is national in nature and the other is international. The study asks how differences in assumptions and cultural meanings can be overcome. How can we go beyond the hypothesised similarities and differences and reach some conclusions in understanding how the systems affect their main users? In some respects, we might argue that the cultural differences are fewer and less significant than we may expect. In purely practical terms, though there may be 200 countries where the International Baccalaureate Diploma is taught, British teachers tend to predominate and most of these teachers tend to have experienced the Advanced Level Curriculum already, whether as teacher or student. In addition, many of the examiners are British. Hence, in the specific aims and objectives employed by these systems, in expectations of course and students, in evaluating and judging effectiveness, there is much to suggest that there are many commonalities as a basis for the research.

Modern comparative analysis requires us to investigate cases holistically and to arrive at some general statements about relationships. There is an in-built conflict between the quantitative approach and the qualitative, an 'old' tension it can be

said, but Ragin (1991) argues that modern comparative method can be achieved through relevant balance of methodology.

It has also been argued that all the data needed for most comparative educational studies is already in existence, and that satisfactory conclusions can be developed through secondary analysis, reworked analysis and meta-analysis (Olivera 1988). In the case of this particular study there is such a dearth of information and data about the International Baccalaureate Diploma in particular, that this cannot be attempted.

Although there is a shortage of definitive research literature, the same does not apply to anecdotal literature. In literature searches of periodicals and newspapers the debate about the two curricula is vehement and ongoing. In the Daily Mail (18/2/2002: 28) the headline reads “*A-level fears force more top schools to offer Baccalaureate*”. The article quotes the Headteacher of Kings College in Wimbledon, Tony Evans as saying:

*I can't see any justification intellectually for staying with A levels-they are not nearly as versatile. The Baccalaureate has a much broader base and, frankly, much more international credibility”.*

The Daily Telegraph (22/12/1999:15) also discusses why more UK schools are choosing the Diploma over Advanced levels. John Clare writes:

*The significance is that the IB has established a worldwide, copper-bottomed reputation for both rigour and breadth, precisely the qualities that appear to elude the re-engineered A-Levels.*

As far back as 1996, there were calls for a broader qualification in England, Wales and Northern Ireland. In the Times Educational Supplement (23/2/1996:1) Colin Jenkins claims:

*The IB has proved that a broader programme can be achieved without loss of rigour. Indeed, there is a high incidence of people getting first class honours degrees.*

In the Daily Telegraph (18/3/1999:9) the Headteacher of Sevenoaks School in Kent compared the Diploma with the Advanced level:

*“It is a more challenging, tougher exam than A-level. A baccalaureate system exists not just in order to prepare pupils for university, but also for life after university”.*

Unfortunately, despite the many references to The International Baccalaureate Diploma and the Advanced Level curricula, comparative evidence remains very difficult to find, unless it is of the kind highlighted above. Whilst there is little mention of an evidence base on which to make the decisions to switch from one curriculum to another, such newspaper articles are valuable in assessing the status of the argument at present.

#### 1.4.2 Qualitative research or quantitative research

The best approach towards an instructional analysis of the two curricula must involve studies of all sectors of the education system from both qualitative and quantitative approaches. A series of micro studies can be offered in order to better understand two complicated curricula. A study of all subjects within the two curricula would be too large and outside the resources of this dissertation. Hence from a subject specific viewpoint studies are conducted around Economics which, except for one section of the syllabus has very close aims, objectives and subject content (Appendix 6). All study of teaching and learning within the two curricula centred around this subject, but this was broadened to include other subjects of the International Baccalaureate and Advanced Level when studies were made of university admissions tutors' and students' opinions and the overall data collected on student achievement at university. Almost all of the information collected encompasses the wider view of the analysis of the two curricula and hence the initial study of Economics must necessarily stand as a micro attempt to understand a macro situation.

As offered in general terms by Cohen and Manion (2000), the aim of a piece of research determines what methodologies are used. In order to facilitate the 'instructional analysis' of the two curricula, it was recognised that a quantitative approach was limiting. One of the reasons for this was that the numbers taking Advanced Levels far outweigh those taking the International Baccalaureate Diploma; quantitative data is useful but requires support. Such is the controversy aroused within national systems regarding the reliability of quantitative- based research that to consider an approach on this basis was considered impractical and unrealistic. Some aspects of the research warrant this. However, emphasis is placed on the opinions and actions of the students, school and university teachers and university admissions personnel from a qualitative approach as well. As stated by Hitchcock and Hughes (1995: 25):

*"The context of teaching and learning itself becomes the focus".*



In fact the study concentrates its resources around these two activities and the Interpretative paradigm used in this piece of research focuses very much on the individual (Cohen et al. 2000:57) as opposed to the positivist approach which is less responsive to the individual's interpretation of the situation. This should not make it less valid by any means; if the sample is reliable then the qualitative approach assumes a much more positivist position. Hitchcock and Hughes (1995) suggest that the qualitative methodology has a great deal of potential and validity for education. Such is the uncertainty inherent in the measurement of learning outcomes that often this methodology seems the only effective way to provide educational analysis. Many researchers argue that action research in education is an important strategy for collecting, assimilating and implementing change, provided it is supported by an effective triangulation structure: recognised by Bell (1999), Hitchcock and Hughes (1995) and Cohen and Manion (2000).

In order to assuage the fears of both sectors, it has to be recognised that there are strengths and weaknesses to any single data collection strategy. Using more than one data collection approach permits us to combine strengths and build in checks and balances. Denzin (1978) recognised that a variety of triangulation techniques strengthened the research. On this basis this study attempts to use data triangulation, whereby it extracts data from people in different status positions, with different points of view on the comparative research and methodological triangulation, using multiple methods to study a problem or thesis. Denzin (1978) explains that:

*No single method ever adequately solves the problem of rival causal factors...because each method reveals different aspects of empirical reality, multiple methods of observation and study must be employed (28).*

If, as stated by the hypothesis of this study, the International Baccalaureate is popularly perceived as a better preparation for undergraduate study than the Advanced Level, then there are numerous influences to consider. Estimating the

effect of a different programme requires a comparison of the individuals involved. The most obvious and widely used programme is control grouping. If there is a specific addition/ improvement to a programme then constructing a comparison group is the optimum approach, whereby one group who have experienced the addition to the programme is compared with another, who have not. More precisely, a fair comparison requires that the two groups possess identical characteristics, in order that background variables can be discounted from weighing the effects of the programme addition. In the case of a comparative curriculum study such a control group is not possible as the number of schools who follow both curricula are extremely few in number and the reasons for using the two curricula are those which should be avoided; namely that students are entered into one or other of the curricula because that is what their circumstances and characteristics have dictated.

What remains in such a study is the triangulation approach, namely two or more methods of data collection. This reliance on the multi-method approach is a necessity because the variables within this study are obvious and cannot be fully eradicated or accounted for. The triangulation methodology will help to filter out the complexities of the data collection. Cohen and Manion (2000:239) comment on the appropriateness of triangulation methodology in assessing educational outcomes, in evaluating teaching methods and elucidation of complex phenomena.

In a comparative study, it is useful to use a combination of quantitative and qualitative data as already discussed, ensuring that the common dichotomy of normative versus interpretative does not arise. Implicit within the collection of data for this study is also recognition that other issues are covered; the issue of time triangulation is dealt with within the longitudinal studies of university attainment, space triangulation is attempted through the use of international schools over at least four continents and a wide sample of schools through ALIS. Criticism that many educational studies register one point in time or particular ethnocentrism can be countered in this instance by the use of an extended array of data.

The instruments of collecting data were chosen in response to the nature of the research area and to resources available. Methods of data collection used in this piece of action research are:

- Questionnaires- to students, lecturers and university admissions personnel
- Subject tests- these were given to students from both curricula, at the same stage of study, taken from each of the respective examination boards
- Longitudinal Studies- undertaken by HESA (Higher Education Statistics Agency) in the United Kingdom, with the specific aim of gaining information from their data base. This information was attempted through contacting individual universities, however financial constraints limited any help given (79% cited lack of resources for extraction of data as the reason they were unable to help)
- Interviews- with students, teachers and university admissions counsellor
- Limited case study of a school, which has recently made the decision to offer both the Advanced Level and the International Baccalaureate Diploma.

Questionnaires were useful for various reasons, the main one being that the International Baccalaureate Diploma is taken world-wide; to rely on personal contact would necessarily have limited the scope of geographical coverage and made the sample unreliable. The structure of the questionnaires proved problematic as each of the main groups recognised by the study as having valuable input, were connected to the curricula at different stages. Many of the questions could not be common to all groups; therefore each of the questionnaires had to address issues specific to the observations and experiences of that group. As advised by Youngman (1987:24), it is important that precise questions are included in a questionnaire as a result of a hypothesis, and not for any superficial reasons. In the case of the major variable, anxiety levels, the questions stemmed from a conference on evaluation at the University of Durham, CEM Centre in 1998 at which the issue of anxiety arose. It was put forward as a thematic base on which to present on evaluative procedures across many different vocational spheres including education. The basic premise was that anxiety is at the root of a great many learning difficulties and should always be included as a study variable, where applicable:

Diener and Dweck (1978), Heinrich and Spielberger (1982), Neale and Katahn (1968).

The hypothesis required an analysis of a wide range of data returned in the questionnaires in order to ascertain any perceived differences in the end product (graduate student) of each respective curriculum. This necessarily required a fair and objective approach, particularly when requesting information from the university personnel, who received both sets of students. To question them from a comparative perspective would necessarily have involved an unacceptably high degree of subjectivity, particularly if the aim of the research was stated. It was decided that, for these respondents, two separate questionnaires would be written, requesting information on only one of the curricula.

It has been stated that particular ethical problems will arise from any research Cohen et al. (2000), Robson (1999) and that the research must inform the respondents of its focus. As each piece of research was concerned with only a specific aspect of the overall study, it was considered inappropriate to state the study's hypothesis within the various research methodologies, but instead to state the focus of that particular part of the study. To have informed respondents and participants that it was a comparative study of the two curricula could have aroused emotional subjectivity and political and ideological constraints.

Determining the samples to be selected was difficult; lists were obtained of all International Baccalaureate Diploma and Advanced Level schools who offered Economics as an option at 16. Such lists do not include details on whether the schools are selective when choosing students to continue study at 16, nor do they give any idea of the Second Language or Special Educational Needs composition of their student body, and the absence of information regarding gender mix is also problematic. To have researched a sample of schools, however, before sending out the tests and questionnaires would have been an enormous task and so it was

decided to send out a random sample, include requests for such information and then analyse the returns.

The student questionnaires were wholly concerned with teaching and learning in the various subjects within the sampled schools (Appendix 7). It was felt that the students should not be given open-ended supplementary questions, as they could not be considered to have expertise or experience in commenting on the quality of the learning experience. What was considered much easier was a quantitative response connected to their classroom experiences: rating scales were used in the student questionnaires and each student was asked to give a rating to the frequency of teaching and learning methodologies employed (Appendix 2). The advantage of this is that easy differentiation of response can be analysed and any discernible trends noted (Cohen et al 2000: 78). The Curriculum and Evaluation Management Centre in Durham was an invaluable help in this study as they made their data base accessible and, consequently over 85,000 Advanced Level students and their attitudes and opinions on teaching and learning within each of the respective Advanced Level disciplines were accessed. This translated into 5302 Economics students for my micro study of this subject. ALIS (A Level Information System) did not cover International Baccalaureate students and hence any comparative study had to be attempted manually. Using the same format as the ALIS questionnaire, a sample number of International Baccalaureate schools were selected and the questionnaire returns analysed for specific differences in the educational experience of students from each of the curricula.

Sampling for the university respondents was similarly random. There is little information available regarding the entrance composition of British universities and hence to ascertain whether initial prejudice exists in favouring one curriculum over others is not possible. The main reason for this reluctance to divulge entry data, it seems, is to prevent schools with a particular exit composition from targeting universities who may appear to favour certain character/ academic traits (UCAS - University Clearing Advisory Service). It has to be assumed that a wide-ranging

sample of universities would make the data more reliable, should such discrimination exist in some institutions. A list of sixty universities was drawn up and it was decided to send five questionnaires to various departments within the universities. Fifty percent of the universities were sent a questionnaire requesting information on their Advanced Level students and fifty percent were asked about their International Baccalaureate Diploma students (see Appendix 3). This would ensure that the problem of emotive subjectivity, mentioned earlier, would be less likely to arise.

The response rate to the questionnaires is of vital importance to the data collection and therefore it was vital to plan a good system of return. Sending the questionnaires out by mail was the best method of distribution world –wide as many e-mail addresses had lapsed or changed, even the very recent ones. This impersonal approach was always likely to result in poor response rate and thus various strategies were employed in an attempt to boost the return rate. Use of two school directories and an educational newspaper (European Council of International Schools, International Schools and Times Educational Supplement) ensured that the letters requesting help were addressed to the Head teachers of the schools in the hope that this might create a personal interest in the questionnaires' return. Both questionnaires and help letters were also printed on yellow paper so that they could be ignored less easily. The costs of postage for the bulky parcels meant that a good response rate was vital from the first posting. Youngman (1987: 127) warned of the possibilities of poor response rates due to the impersonal nature of this method of data collection. Follow-up letters were used when there was no response after 30 days (or 45 days for Africa, after advice from the postal service).

The teachers' interview questions were the most difficult to construct as it was felt that to ask teachers about the two curricula in isolation, would serve no purpose within the context of the research. Student responses to teaching and learning activities within the subjects of the two curricula were considered sufficient for comparison purposes, when taken together with the other data. Teachers with no

experience of the other curriculum were not used in the study, however it was considered pertinent to use the expertise of teachers who had an overview of both curricula. Questions were thus constructed on the basis of this extreme case sample; teachers who have taught in both curricula, who could lend their expertise on this area of interest. The use of such extreme case samples is not without its difficulties, as recognised by Robson (1999), who warned of the inherent difficulties of analysing data from individuals who may have a personal interest in the research question.

A number of common investigative issues are related to ensuring that the findings of such a comparative evaluation are credible. These are reliability, validity and sampling. In the case of reliability, there are two distinct dimensions: the first, inter-judge reliability is difficult as it requires two investigators working on the same research topic. The second one, intra-judge reliability, does relate to this study as the staged return of many of the components of the study with respect to questionnaires and examinations, for example, meant that different samples arose naturally. This allowed for a systematic collection and study of data, with appropriate cross-checking.

As far as the concept of validity is concerned, research must measure what it was intended to measure and more than one source of evidence or more than one data collection technique is necessary. The hypothesis called for triangulation as vital, in view of the opportunity to prove the null hypothesis if study was limited to a particular corner of the curricula.

When the data collection was in its planning stages, it was recognised that it was possible to collect too little data from too narrow a range of sources and hence risk generalisations, or triangulation data collection may result in too much data. McCormick and James (1983) identify quantitative data as random selection from all the population, not necessary for this study, and stratified sampling, a division into sub- groups. The study recognised the need for this latter method, but also

recognised that it required a large population size. More suited to this study were their ideas on qualitative sampling, whereby they advocated convenience or opportunistic sampling, starting with the available body of available respondents and theoretical sampling, selecting data according to its capacity to inform theory and confirm, refine or falsify emerging hypotheses.



#### 1.4.4 Analysis and synthesis of literature study

There has been very little done to relate the two curricula, either to each other or to respective attainment levels in higher education. Except for the study referred to previously (Fox 1998) and a limited study into the attainment of International Baccalaureate students at US universities and colleges of Higher Education (Thomas 1988) little could be found that is directly relevant to the aims of this study. There was a more recent study carried out in Canada which gave findings relating to differences in teaching between International Baccalaureate teachers and Alberta state teachers in the pure Sciences. Poelzer and Feldhusen (1996:32) concluded:

*“All teachers taught IB students differently from regular students. They required IB students to do more laboratory work of very high quality and do the lab assignments with minimum direction”.*

This study had only 11 participant teachers, who taught both cohorts of students. It was further limited by the fact that the teachers and the students knew the purpose of the study. Poelzer and Feldhusen did not use student evaluation, though their study is the only one available, which compares International Baccalaureate and external syllabi. Qualitative teacher input regarding the characteristics of International Baccalaureate students concludes that International Baccalaureate Diploma students more commonly possess:

*High levels of motivation, task commitment, questioning, independence, intelligence, ability to see connections among concepts, desire to understand; management skills and taking responsibility for their own learning (33).*

What the study does not do is question the students regarding perceived differences in teaching or learning, nor does it include the methodology behind the collection of

qualitative information. The study has an abundance of quantitative information regarding the use of base line testing but gives no information on class sizes, resourcing and other such variables. Most tellingly, the study has no information regarding the initial selection procedures and student profiles of the different student cohorts. The approach is valuable as a starting point for further research, but does need to be supplemented by qualitative research into the behavioural patterns of students and teachers in the International Baccalaureate classroom and, of course, it has no direct relevance to the main curricula comparison between Advanced Level and Diploma.

When attempting to look into the pedagogy of teaching and the influences on learning in general, the amount of literature is vast. Relating this to the two contrasting curricula however, is something, which can only be attempted through further research. In other spheres of education it would appear that the curriculum affects teaching methodology and this is something this study will attempt to discern with relation to the two respective criteria. When the new Advanced General National Vocational Qualification (now named the AVCE) was created in England and Wales, it was intended to supplement the absence of an 'applied' route in 16-18 education. Run mainly by schools and colleges of further education, it is commonly taught by the Advanced Level teachers, yet there is evidence to suggest that methodology varies greatly. If this can be shown to be the case across these two particular curricula, then it may help to explain the teacher/ student transmission mechanisms for the acquisition of skills observed in students of the International Baccalaureate Diploma. At present, there are no referenced studies of how GNVQ (AVCE) students fare at British Universities, possibly because it is such a relatively new qualification. However, the research into the teaching process is particularly interesting because it highlights the ways in which a curriculum imposes certain teaching traits on the teacher. If we link this to the studies on knowledge and skills acquisition, the learning process and recent research on the human brain, then we have a sound basis for study of teaching and learning issues within the two

curricula: Hart (1999), Kovalik (1997) Wolfe (1997) explain general research findings.

What comparative research on Advanced Levels and General National Vocational Qualifications would seem to suggest is that there are discernible differences in the teaching and learning approaches within the two curricula. Edwards et al (1997) notes that 'GNVQ's tend to move the emphasis from teaching to learning'. Her Majesty's Inspectorate (HMI 1991, section ix) refers to “*a shift in teaching styles away from the abstract and theoretical approaches towards more practical and relevant forms of participation*”. Abbott (1994:49) wrote of the need within education to move away from 'solitary study and emphasis on analytical writing' towards an emphasis on working with others, mixing categories of knowledge, verbal skills and problem solving. He recognised that these attributes were valued as an approach to learning which were more highly valued within a changing economy. However, the AVCE is very much an applied qualification, based around employment trends, such as 'Leisure and Tourism' and 'Health and Social Care'. Both the Advanced Level and the International Baccalaureate curricula retain very similar academic composites and this suggests that their teaching methodologies will not face the same teaching demands as AVCE qualifications.

Nevertheless, the very fact that past curricula comparison has been attempted is basis on which to set up another study. Many of the methodologies employed by the GNVQ (AVCE) and Advanced Level comparative study appear to have definitive results Edwards (1997), however the pedagogic base of GNVQ is very different from that of the Diploma and this means that caution is required in interpreting data.

In the process of preparing a curriculum comparison, the issue of what to compare is vital. The study relied very much on established benchmarks of teaching and learning; skills and attributes promoted by educationalists as necessary at the present time. 'Future' possible learning developments-new types of schools, open plan classrooms, e-learning, flexible ICT learning across age groups- deserve

coverage, however they are not specifically covered by this particular study. This thesis retains a connection with curriculum structural development, rather than a wider picture of educational change.

## 1.5 Further Programme of Study

In chapter 1, the issue of curriculum composition and structure has been raised with specific reference to the two curricula for study. The background to the problem confirms government involvement in curriculum structure and widespread concern about standards of learning within education worldwide and the common problem is reconciling the need for a flexible, adaptable, well-educated workforce, with the idea of what constitutes a pre-university education. In essence, the ‘essentialist’ tradition still seems to hold dominance in academic circles in England, Wales and Northern Ireland. Literature studies have found little precedent for comparing these two curricula approaches; the research methodologies therefore rely strongly on triangulation and a variety of data collection techniques. Qualitative sampling, based around opportunistic sampling, provides the main basis in selecting data according to its capacity to inform theory and the chapter provides a comprehensive explanation of the study methodology.

Chapter 2 studies the ‘end-users’ of the educational process, namely the higher education establishments. Through the use of open-ended questionnaires and ratings scale questionnaires and analysis of statistics provided by the Higher Education Statistics Agency (HESA), conclusions are formulated regarding the relative preparedness of graduates from each of the respective curricula in terms of how they adapt to higher education and their final attainment levels with regard to degree classification. The chapter also uses figures supplied by the University Clearing Advisory Service (UCAS) to compare entry points requirements for a selection of universities in the UK and this provides a the degree of entry acceptance parity between the two curricula.

Chapter 3 is a micro study of Economics teaching and learning within the two curricula and asks whether this exemplar subject highlights attainment differences between the two curricula cohorts. This was achieved through the use of multiple choice examination questions, taken from each curriculum and given to the separate

cohorts. The results were then subjected to a form of split half analysis and conclusions formed regarding the relative difficulty each cohort faced in taking the examination of the other. This was extremely valuable in critically evaluating the charge that curriculum breadth automatically entails a dilution of attainment standards; particularly pertinent in this study as the subject time allotments for Economics over the two curricula vary by as much as 30%.

Chapter 4 entails an analysis of teaching and learning across the two curricula. Taking the Advanced Level Information System (ALIS) teaching and learning questionnaire as a model, this section analyses student perceptions of teaching methodologies employed within Economics lessons across both curricula and attempts to form conclusions regarding teaching approach differences. This is linked to discussion of learning theory, integral to which is the question of what constitutes 'real learning', as opposed to the less useful 'transmission' of knowledge. In addition to the study of Economics, the study also analyses how teaching and learning vary across different subjects and how this may impact on students who are obligated to study across discipline boundaries.

Chapter 5 is a study of student and teacher perceptions of curriculum, with a particular emphasis on case studies of a student who has studied in each system, teachers who have taught in both systems, and a school which has introduced both the Advanced Level and International Baccalaureate, to run concurrently. The school is supported by case study interviews with a selection of students and the University and Careers Guidance Counsellor. The purpose of this chapter was to utilise qualitative data on a 'grounded theory' basis by which issues from the case study data emerge as a basis to triangulate previous research findings, or provide alternative research initiatives.

Chapter 6 arose as a result of the university admissions personnels' perception that International Baccalaureate Diploma students displayed higher levels of intellectual 'risk-taking' (chapter 2). Together with widespread research that places confidence

and self-image as primary determinants of educational attainment, the chapter concentrates on how far the differences in anxiety levels are linked to the respective curriculum structures. The use of a small ratings questionnaire, with reference to supporting theory, provides a basis on which to form limited conclusions regarding the reasons behind anxiety in post-16 schooling.

Chapter 7 is the concluding chapter and offers recommendations, including suggestions for future research.

## Chapter 2

### STUDIES IN HIGHER EDUCATION

#### 2.1 Introduction

Given the massive investment in further and higher education in England, Wales and Northern Ireland, it is pertinent to study the optimum means of preparing young people for university life. Post-16 education is the major step towards higher education and the demands which subsequently arise, namely independent study and self-sufficiency in many other areas of life, together with learning situations far removed from the usual school structures. It is vital therefore, that this 'systems' transfer is studied and that questions are asked about the adequacy of the means of preparing students for this learning progression. In prioritising the means of investigation, the study initially targeted universities as they received graduates of both International Baccalaureate Diploma and Advanced Level, unlike the schools who assessed each cohort separately, according to their curriculum, and very few possessed a combined overview.

#### 2.2 The Requirements of Higher Education

The measure of any given unit of input is always the quality of output. The objective of the study is to ascertain the preparedness of school graduates from two distinct curricula for Higher Education. The quantitative measure of degree classification clearly showed higher levels of academic achievement from the International Baccalaureate students in the proportion of Class 1 degrees earned. It has been impossible to ascertain whether these students moved into courses more suited to their natural abilities, such as language for example. It is also advisable to treat the figures with caution, as their sample size differences are so great, although a trend is established. The most appropriate methodology to supplement the picture



emerging of distinct differences in the graduates of each of the respective curricula is more qualitative.

Questionnaires to admissions officers highlight a perceived difference between the graduates of the two curricula. Key differences lie in the distinction between 'knowledge' and 'understanding'. The latter can be shown to be transferable, into new contexts and new theories. Knowledge, however, can be rote and perform no more specific function than that of aiding the student through that particular part of his or her course. Howard Gardner (1991: 9) contended that:

*“Understanding (occurs) when students are able to take information and skills...and apply them flexibly and appropriately in a new and somewhat unanticipated situation”.*

The move to university or college is the biggest upheaval faced in the lives of the majority of students and, in an academic sense, the new pedagogy with which they are faced, the lectures and the study time given, ensure that pure 'knowledge' is inadequate. Critical thinking theory, as espoused by Bloom (1956) encompasses how knowledge is a foundation of study, but higher levels of cognitive ability and deeper learning is highlighted by the ability to synthesise and evaluate. When an individual can speculate, give a substantiated opinion, judge, value and generate other possibilities, they are adjudged to have benefited from an education which stimulates critical thought and divergent thinking skills. To label thinking as 'lower' or 'higher' level however, is to miss the basic connection to curriculum planning and structure: the contention must be that if a curriculum is limited in its scope, then the knowledge base and the understanding necessary to generate Bloom's critical thinking skills are missing. Bentley (1998) comments that:

*A growing number of studies suggest that even those with formal knowledge of a subject can be bad at using it in unfamiliar surroundings or to solve novel, complex problems. This inability to transfer knowledge from one domain to another points to a lack of real understanding (9).*

Courses and syllabi which embody a limited approach of study in depth, with little cross-disciplinary referencing, will continue to result in students who do not satisfy many of the requirements of Higher Education teaching administrators. In open-ended questionnaires sent out to ten universities, based on submissions to the National Committee of Inquiry into Higher Education in 1996 (Appendix 4), similar opinions were expressed. All three universities pointed to the need to develop a broad range of general and transferable skills. These skills included communication skills, teamwork, leadership and problem solving abilities.

Below are relevant extracts from the open-ended questionnaires that highlight the needs of these particular universities. The objective of the questionnaires was to ascertain the qualities, skills and aptitudes recognised by universities as a basis for effective student learning profiles. These were then used to formulate a later ratings questionnaire for a wider range of institutions.

The University of Westminster (question 1) pointed to:

*“The need for developed time management and learning skills which enable them (students) to fully exploit opportunities for lifelong learning”.*

The University of Sussex (Question 1) points to:

*“The need for a broad knowledge base combined with a capacity to seek out, identify, process and apply highly specialised knowledge”.*

The consensus is that personal development in the form of learned learning strategies, understanding and confidence within a subject and a capacity to apply problem solving skills across a range of disciplines, particularly Science and technology, will be vital over the next two decades. Most tellingly, the University of Birmingham (question 1) states that:

*“Narrowness of approach is generally unwelcome”.*

When the universities were questioned with regard to their opinions on what constituted good teaching practice within the curriculum, the answers were similar again. The University of Birmingham offers the opinion that:

*"There is a need to encourage students themselves to take greater responsibility for the learning process...to enable them to learn independently" (Question 2).*

The University of Westminster looks at the longer-term aspirations for teaching and learning:

*"(They) should lead to understanding, reflection, transferable skills and the potential for lifelong learning" (Question 2).*

Within the Theory of Knowledge course, and explicitly stated in the International Baccalaureate Diploma's mission statement is a philosophical repetition of the above. Whether the aims of these particular universities differ markedly from other universities in Britain can be investigated through further study, but it is pertinent that there is some ideological overlap between the aspirations of the universities and the International Baccalaureate Organisation. However, subject specialisation retains a dominant requirement and it would appear that it sets the mode of teaching and hence, of learning, as emphasised by the University of Westminster:

*"Effective teaching also involves the use of a range of different approaches relevant to the discipline" (Question 2).*

In many ways, this recognises the need for different teaching approaches, but within one discipline; what we will attempt to show in this study is that this may not be appropriate as each subject specialist from a traditional subject background will use different approaches, but does not recognise the benefits of Kolb's (1976) learning theory differences. Therefore it is the learning approaches of the students which require emphasis, not teaching methodologies. This will be explored in depth in the later chapter 4 on teaching and learning.

When the universities were asked about the entry requirements for students into Higher Education, the University of Birmingham commented that entry should use *"A levels, and those of proven equivalence such as the International Baccalaureate Diploma" (Question 3).*

The University of Westminster:

*"Recognises an increasingly diverse range of qualifications as 'standard', including the International Baccalaureate Diploma".*

The University of Sussex encourages:

*"Entrance by A Level qualifications and their equivalent (Baccalaureate)" (Question 3).*

In the initial mailing to universities no mention was made of the purpose of the study. It can be claimed that the equivalence of International Baccalaureate Diploma and Advanced Levels is assumed in a quantitative sense and UCAS (Universities Clearing Advisory Service) figures reflect this in their points offers to students. However, how far the curricula differ in terms of preparing students for the rigours of university study must be considered by other means, particularly as the open-ended questionnaires had such a low return rate. This type of questionnaire has many advantages, though the time factor is a great deterrent to many respondents.

In choosing the universities to send the questionnaire to, random sampling was used so that each university had an equal chance of being included in the initial ten questionnaires sent. The reason for the limiting of the questionnaires to ten was mainly for administrative reasons; this study was an aid in the construction of the attitudinal surveys sent out to 100 universities and was a means to point future aims and objectives of Higher Education, rather than provide definitive data for the aim of this study. Broadly, the open-ended questionnaire could have employed cluster sampling so that any future interview expenses were kept to a minimum, or

purposive sampling would have been an option within the confines of contacts made in the course of the study. Both were discounted on the basis that many International Baccalaureate students are reported to choose universities near airports in order to be able to travel home cheaply and quickly. It therefore stands to reason that those universities would have greater knowledge of the International Baccalaureate Diploma, and arguably the students from the IB system with higher grades as universities with airports nearby would benefit from the English university clearing system which rewards students with their first choice university should their grades be appropriately high. Additionally it was felt that purposive sampling would create problems because the contacts made in the course of this study would have expressed some previous interest in the International Baccalaureate Diploma.

Researchers have always indicated the importance of defining data gathering objectives before the questionnaire is structured and the questions framed. In this case the data on university teaching is vast and there is little that can be added to this information bank without the questionnaire appearing trite and subject specific. It was felt that the gathering of data on more specific attitudes towards student approaches would be better in a quantitative, scaled data gathering exercise. In the case of this open-ended questionnaire the methodology was to refer the respondent to questions of a general nature, yet questions which asked them to consider the future of Higher Education and the anticipated qualities of the 'product' i.e. the student. The structure of the questionnaire had to recognise the time constraints which senior personnel within the higher educational establishments worked to.

The preparation for the questionnaire included an advance-warning letter, explaining that the purpose of the questionnaire was to provide information for a study into the skills and learning approaches of graduates over the next twenty years. After the questionnaires had been with the respondents for three weeks, a follow-up letter was sent requesting the return of the questionnaire and stressing the need for the opinions of the respondents. In this case the return rate of 33% was

disappointing, yet probably understandable in view of the length of answers required and probably, the need for consultation within the institution itself, before an answer could be written on behalf of the university. The sample return is always problematical as it can be assumed that the non-respondents have particular reasons for not returning the information. In this particular case, as the questionnaire was not to be used for any comparative, emotive purposes, it was decided to admit the questionnaires as valuable background information in helping to prepare a questionnaire in measuring more specific skills and qualities.

## 2.2 Admissions ratings Questionnaire

The ways in which it is possible to 'see' the end product of each of the respective curricula is to ask the end-users. In a later chapter we can observe the ways in which students themselves perceive their educational experiences, but we must also acquire information from the people who judge their attainment and attitude, namely their university teachers. The previous open-ended questionnaire set a basis for asking about the relative content of particular qualities desired by Higher Education establishments within Great Britain. The study could then set the basis for the ratings questionnaire. Although ratings scaling has its particular critics, it was decided to use this system of questioning, rather than open ended questionnaires, particularly as the time constraints of the latter had created 'returns' problems.

The award of a numerical value is an attempt to provide some kind of objective assessment of a given factor or situation. Admittedly, the use of ratings invites many possible errors, even though it may be concealed beneath a veneer of numerical objectivity. The lack of fully explained assessment criteria are a feature of such questionnaires in the pursuit of simplicity and time constraint factors. Much educational research has shown that the inconsistencies of ratings scales, particularly when applied to individuals, with some kind of time lag included, do indeed present inaccuracies. In constructing an objective ratings scale it is vital to define the dimension or dimensions which is/are being rated. It should be possible to describe it so that it will have approximately the same meaning to all raters being involved in the study. We must also decide on the number of steps within the ratings scale. Some research points to the use of an uneven number in order to have a neutral category at mid point. This is due to the fact that, as Oppenheim (1992:54) points out, raters are a little afraid of using the extreme categories- a phenomenon known as the error of central tendency.

Despite its problems it was felt that the use of a ratings scale would serve the purposes of the study. The difficulties associated with this kind of data collection were partly overcome by various factors:

- All the respondents were university personnel, adept at rating students or services.
- The qualities and skills listed within the ratings questionnaire are common in the educational field, with a generic understanding of what is meant by such terms.
- Differences in individual perceptions of the ratings scale were relatively unimportant as there was a separate cohort sample questionnaire for each of the curricula.
- The emotive aspect of the questionnaire was partially eliminated as wording specifically referred only to one curriculum, though of course it was impossible to allow for personal prejudices regarding one curriculum or the other.

The choice of possible respondents was a difficult one; the university admissions composition profiles are not available to researchers or the general public and hence there was a possibility that the questionnaire would be sent to universities with little knowledge of the curricula. There was also the problem of choosing which university faculties to use for the database, particularly as the number of universities multiplied by faculties within each university numbers many thousands of possibilities. The problem of sampling is that it is full of pitfalls, even for the experienced researcher. There is a need to look at compromises between theoretical sampling requirements and practical limitations such as time and resources. In this particular instance we have the added complication of approaching possible respondents from a wide range of disciplines, becoming burdened with the probability of skewed data if a preponderance of certain disciplines is recognised.

It was decided to approach the sampling from two different directions (more would have been preferable, but would have needed an even larger sample). A list of all possible BSc (Bachelor of Science Biology) faculties would comprise one target area and the BA (Bachelor of Arts Economics) faculties would comprise the other. The questionnaires would be sent to 50 of the possible respondents from one



faculty, split 25/25 between a questionnaire specifically requesting information on the International Baccalaureate students and one requesting information on Advanced Level students. The other 50 would be sent on the same basis to the other faculty. Even with this large number of questionnaires, the issue of sampling error has to be acknowledged, exacerbated by the average response rate of 65%.

A pilot questionnaire gave some valuable feedback from colleagues regarding ambiguity, specifically that the issue of drop-out could be read in two ways. The length of the questionnaire was also altered to counter the sense that the page was too full and inhibiting. Hoinville and Jowell (1978:12) identify a number of factors in attempting to obtain a good response rate to a postal questionnaire:

*“ It must look easy and attractive.. with plenty of space for questions, arranging the contents in such a way to maximise space” .*

A covering letter indicated the aim of the questionnaire and encouraged a reply, giving the respondents a brief outline of the aim of the research. A three-week interval was allowed before a follow-up letter was sent. The return rate was relatively low, as had been the case with the previous open-ended questionnaire. Perhaps the reasons are due to the nature of universities, their size may be a prohibitive factor in receiving mail and having the opportunity to pass it back through a central administration. It may also be the case that studies of this type are becoming more common as the universities suffer from under funding and the problem of payment by results; these include time spent on research and publications league tables for the researchers. The main point to be made here is that sample size assumes an increasingly more important position if there are a greater number of sub-groups. As this study, arguably has few sub-groups, we can use the information brought in by the questionnaires, ostensibly to formulate some basis on which to triangulate results.

The data received from the respondents is interesting in the context of subjective judgement, if not as empirical evidence of the benefits of recruiting students from

one curricula over the other. The recruiters were asked to apply ratings, ranging from one to seven, on the students from the respective curricula (see Appendix 3). Judgements were offered on 18 differing ‘attributes’, ranging from note taking to risk taking. From the graph constructed below, it can be seen that the skills and attitudinal measurement differs from the International Baccalaureate to the Advanced Level student as shown in the data provided by the BA faculty returns. The data comparison from the BSc is less instructive and requires further research, but it is plain that there is no marked negative perception of the International Baccalaureate Diploma students in either of the returns. Neither is there a distinctive positive one in the BSc feedback.

In the construction of the original questionnaires, three distinct categories were mixed together, namely Core Skills, Attitudes and Curriculum. The first two categories were seen to be the qualities which undergraduates were expected to possess, whatever their background, however, the third category, ‘curriculum’, contained ratings items more connected to faculty requirements.

The x axis relationship is specified below:

| X  | Category 1            | X  | Category 2             | X  | Category 3           |
|----|-----------------------|----|------------------------|----|----------------------|
| 1  | Note taking           | 3  | Tutorial contributions | 4  | Subject Knowledge    |
| 2  | Essay Writing         | 7  | Commitment             | 12 | Global Awareness     |
| 5  | IT Skills             | 8  | Self Discipline        | 14 | Practical Abilities  |
| 6  | Research Skills       | 11 | Attendance             | 18 | Abstract Logic       |
| 10 | Spelling              | 13 | ‘Drop-out’ Rate        | 17 | Risk Taking Capacity |
| 15 | Examination Technique | 9  | Communication Skills   | 16 | Academic Attainment  |

Figure 2.1 Bachelor of Science Faculty responses to university  
Ratings questionnaire

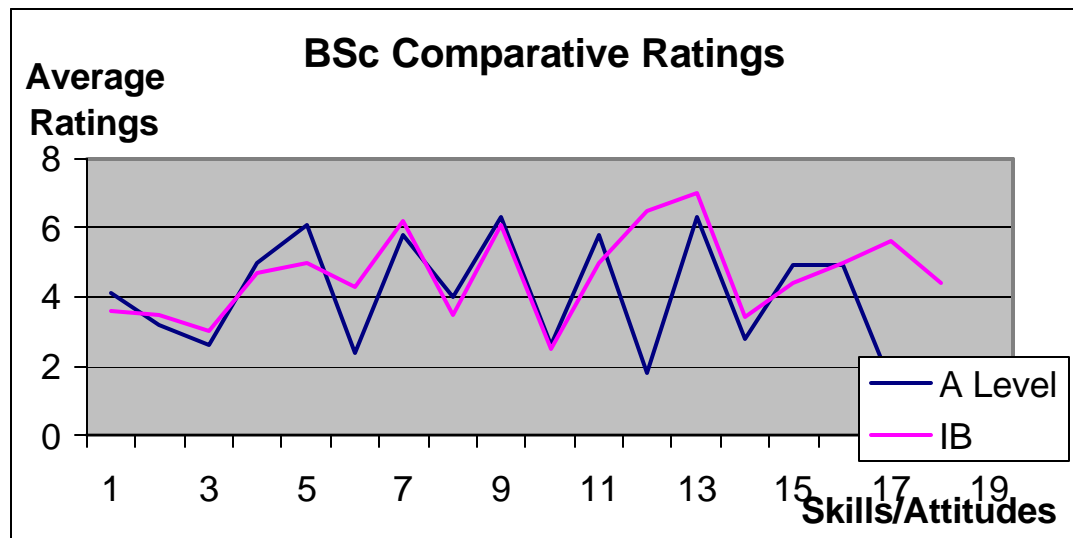
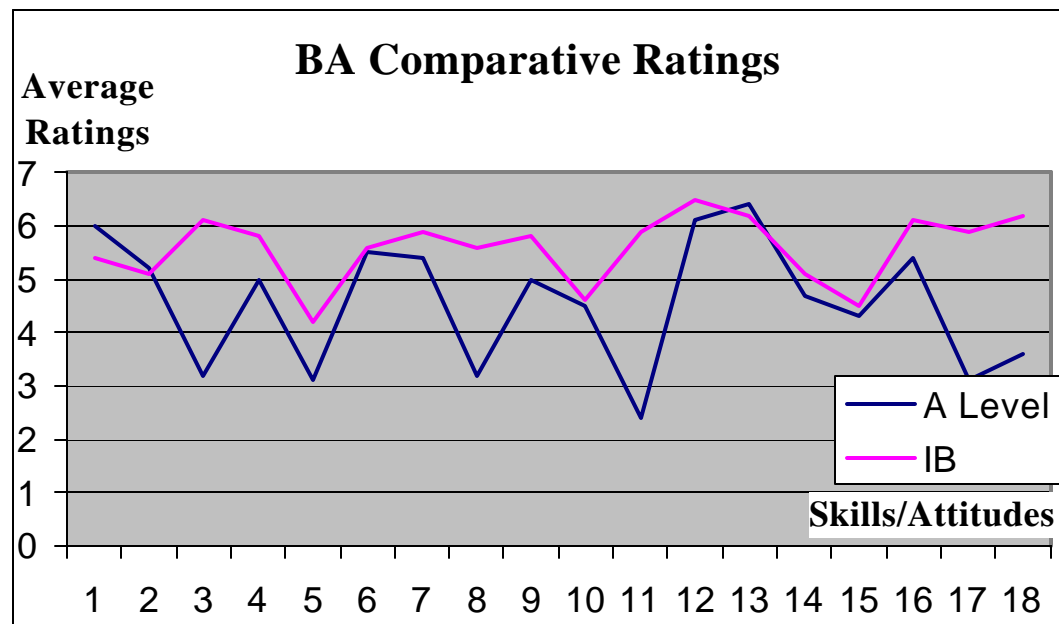


Figure 2.2 Bachelor of Arts Faculty responses to university  
Ratings questionnaire



The mean ratings are indicative of the perceived superiority of International

Baccalaureate students in the Humanities/Arts faculties as far as the raw data was concerned, but it was considered limited.

Based on the experimental hypothesis that International Baccalaureate Diploma students are more popularly perceived as better prepared for Higher level study, than Advanced Level students, a form of the Mann Whitney U Test was applied to the random samples (N-19) and (N-21), which generated Table 2.2. The basis for the Mann Whitney U-test involved ranking the entire data set, then examining how the ranks related per level of the independent variable. To retain the null hypothesis, which would state that a difference would be due to chance, we would expect the ranks to be evenly distributed across the two levels of the independent variable. It is a fact that most of the classical statistical methodologies assume that samples are drawn from normally distributed populations and allow the estimation of the parameters of such populations. In this case however, a parametric assumption would cause problems as we have categorical data and the idea of normal distribution is inappropriate.

Studies on the three question groupings yielded the following information:

$$U = N_1 N_2 + \frac{N_1 (N_1 + 1)}{2} - R_1$$

| <i>Question Group</i> | <i>Value Obtained</i> | <i>Critical Value for a two tailed test at 0.10*</i> |
|-----------------------|-----------------------|------------------------------------------------------|
| <i>Group 1</i>        | <i>153</i>            | <i>123</i>                                           |
| <i>Group 2</i>        | <i>141</i>            | <i>123</i>                                           |
| <i>Group 3</i>        | <i>111</i>            | <i>123</i>                                           |

*\*Green and D' Oliveira (1999:appendix 2)*

Significantly, categories 1 and 2 generated observed values greater than the critical value; results were not significant and thus the null hypothesis is accepted.

In category 3 however, the result showed a difference between critical value and the observed value, in favour of the latter. What this would seem to suggest is that the perceived differences in curricular cohorts are limited to areas of education which are much harder to quantify in the main. Similarly, if the study had been able to concentrate on specific practices such as superior essay writing, more expertise in IT, research and suchlike, the conclusions would have been much easier to formulate. So too if the attendance rates or retention rates had been judged to be significantly different. The factors remaining are the curriculum concepts most needing qualitative substantiation, namely risk taking, global awareness and use of abstract logic. One exception in this group is 'academic attainment', which we can subject to longitudinal quantitative study, albeit limited.

The issue of academic attainment will be tackled with reference to HESA (Higher Education Statistics Agency) figures on university attainment through degree classification, but unfortunately there are no subject breakdowns and hence the Arts and Humanities /Science division can be taken no further from this quantitative perspective. Other items in this category will have to be approached in later parts of the study: Whether such qualities as increased intellectual risk taking, increased global awareness and ability to use abstract logic, can be explained, remains to be seen. The ratings data has given a basis from which to develop the instructional analysis, but in many ways it poses the questions the study will further attempt to answer.

The Arts/ Humanities and Sciences divide links closely to comments made by Thomas (1988:10) when commenting on the relative preparedness of International Baccalaureate students for US universities:

*"The curriculum design matches the liberal arts tradition of American colleges".*

The apparent distinction that arises between BSc and BA perceptions of International Baccalaureate students requires further study and later on in this chapter it is related back to a study on entry points requirements.

Ratings studies such as this one rely for their effectiveness on the honesty and objectivity of the respondent. In some such studies the respondent may try to give false information in order to intentionally distort the results should there be some personal motive for doing so. In planning this investigation the likelihood of university personnel having various curricular preferences was recognised, but it was felt that projective techniques of measurement were unnecessary if the respondents were not asked to make an explicit comparison. It was felt that it was better to have items within the questionnaire, which could provide a form of item analysis in order to achieve internal consistency.

## 2.3 University Degree Classifications

The pertinent issue, as has been stated, is whether these perceived differences in students are supported by other evidence. It can be tentatively established that International Baccalaureate students do seem to achieve more Class 1- 'First' degrees in the British Higher Education system than their Advanced Level counterparts and a trend has certainly been established. However the distinct variance in sample size means that any conclusions must be tempered with much caution. In figures supplied by the Higher Education Statistics Agency (HESA) for 1996 and 1997 the trend is noted below – higher percentage levels of Class 1-degree classification attainment by the International Baccalaureate intake.

The obvious flaw in assessing the importance of these figures is the much wider character profiles, in pure numerical terms, of Advanced Level students attending British universities. As the Advanced Level caters for a national population, only a complete replacement of Advanced Levels with the Diploma could give a true picture, in terms of equal sample population sizes. This will probably never occur, and hence a limited study in trends must suffice, bolstered by other, separate areas of data collection. In addition, as the examination categories changed in 1997, these figures are the only comparative ones available and are already 7 years old.

*Table 2.1 HESA Degree classification figures 1996*

*1996 (See Appendix1 For full student classification)*

|                                       | Classif.                   |                                   |                     |                   |                    | Popul. |
|---------------------------------------|----------------------------|-----------------------------------|---------------------|-------------------|--------------------|--------|
| <i>Highest Qualification on Entry</i> | <i>First class honours</i> | <i>Upper second class honours</i> | <i>Lower Second</i> | <i>Third/Pass</i> | <i>Grand Total</i> |        |
| <i>Mixed GCE A/AS Levels</i>          | 6,7%                       | 46,0%                             | 38,3%               | 9,0%              | 100,0%             | 85460  |
| <i>International Baccalaureate</i>    | 9,4%                       | 41,9%                             | 39,2%               | 9,6%              | 100,0%             | 410    |
| <i>European Baccalaureate</i>         | 8,0%                       | 36,0%                             | 48,0%               | 8,0%              | 100,0%             | 50     |

*Table 2.2 HESA Degree classification figures 1997*

*1997 (see Appendix 1 For full student classification)*

|                                | Classif.            |                            |              |                  |             | Popul. |
|--------------------------------|---------------------|----------------------------|--------------|------------------|-------------|--------|
| Highest Qualification on Entry | First class honours | Upper second class honours | Lower Second | Third Class/Pass | Grand Total |        |
| Any GCE A OR AS combination    | 8,3%                | 49,2%                      | 35,8%        | 6,8%             | 100,0%      | 127650 |
| International Baccalaureate    | 12,9%               | 48,9%                      | 31,8%        | 6,4%             | 100,0%      | 870    |
| European Baccalaureate         | 9,3%                | 47,0%                      | 36,4%        | 7,3%             | 100,0%      | 150    |

Although a limited trend is established, it could not be followed further as HESA (Higher Education Statistics Agency) changed their method of data collection and began to categorise all 'Baccalaureate' qualifications together, which included the separate European Baccalaureate. Hence the distinct categories mentioned above disappeared and data was only available on an individual basis.

The figures are enlightening, and though a few years out of date, they are reflected in a small-scale study carried out for St Dominic's International School in Portugal (between 1997 and 1999). Here, in an attempt to ascertain whether the above trend continued after 1997, limited study yielded a sample of 134 International Baccalaureate students in one school, St Dominic's International School in Lisbon, Portugal, taken from the graduating classes of 1997, 1998 and 1999 (university graduation usually following three years after each respective date).

*Table 2.3 Individual degree classification study 1997-1999*

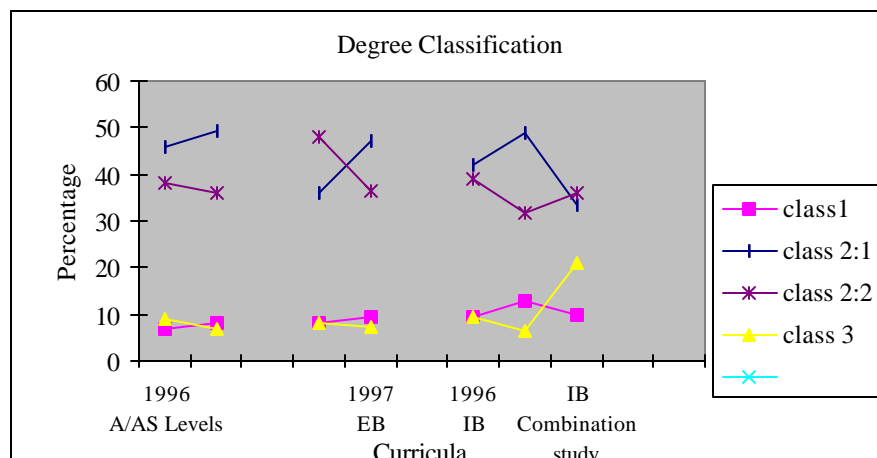
|   | UNIVERSITY | CLASS 1<br>DEGREE | CLASS<br>2:1<br>DEGREE | CLASS<br>2:2<br>DEGREE | CLASS 3<br>OR PASS |
|---|------------|-------------------|------------------------|------------------------|--------------------|
| 1 | Sussex     | 3                 | 5                      | 7                      | 4                  |
| 2 | Imperial   | 2                 | 3                      | 9                      | 3                  |
| 3 | LSE        | 1                 | 5                      | 9                      | 0                  |
| 4 | Oxford     | 2                 | 8                      | 0                      | 1                  |



|    |             |    |    |    |    |
|----|-------------|----|----|----|----|
| 5  | Bristol     | 2  | 0  | 3  | 1  |
| 6  | Cambridge   | 1  | 1  | 2  | 1  |
| 7  | Aberystwyth | 1  | 3  | 1  | 0  |
| 8  | Bath        | 0  | 1  | 3  | 1  |
| 9  | Edinburgh   | 0  | 1  | 3  | 1  |
| 10 | Liverpool   | 0  | 2  | 1  | 2  |
| 11 | Nottingham  | 0  | 3  | 1  | 1  |
| 12 | UMIST       | 0  | 2  | 0  | 2  |
| 13 | Durham      | 0  | 2  | 0  | 2  |
| 14 | Essex       | 0  | 0  | 3  | 1  |
| 15 | Reading     | 0  | 1  | 0  | 2  |
| 16 | Swansea     | 0  | 1  | 1  | 1  |
| 17 | Birmingham  | 1  | 1  | 1  | 0  |
| 18 | Cardiff     | 0  | 1  | 1  | 0  |
| 19 | East Anglia | 0  | 1  | 0  | 1  |
| 20 | Keel        | 0  | 1  | 1  | 0  |
| 21 | Warwick     | 0  | 0  | 0  | 2  |
| 22 | Aston       | 0  | 0  | 1  | 0  |
| 23 | Bradford    | 0  | 1  | 0  | 0  |
| 24 | Exeter      | 0  | 0  | 1  | 0  |
| 25 | Hull        | 0  | 0  | 0  | 1  |
| 26 | Leeds       | 0  | 1  | 0  | 0  |
| 27 | Leicester   | 0  | 0  | 0  | 1  |
| 28 | Salford     | 0  | 1  | 0  | 0  |
|    | TOTALS      | 13 | 45 | 48 | 28 |

The findings from the studies are summarised below in Figure 2.1

*Figure 2.3 Trends of Degree Classification 1996-1999*



Across the HESA studies (and including the IB Combination study), it can be recognised that Class 1 degree classification is higher in percentage terms over the given years, though the individual school study (IB Combination Study) shows a marked discrepancy in the percentage of Class 2:1 degrees obtained.

These are pertinent to the study in two main ways:

1) The HESA figures could not be broken down into subject specific disciplines and one of the main concerns regarding both the HESA information and this particular student sample was whether differences in Class I degrees obtained were due to choice of languages as a degree course. Of course, if these were to be taken in a language other than the students' mother tongue then it was not a factor, however if the language was the mother tongue then it would lead to a specific advantage in gaining of a higher degree classification. What this small-scale study showed was that modern languages took up only 5 out of the chosen 134 courses (3.7%). According to figures on graduate choices in 1998 (UCAS-University Careers Advisory Service, pp14 and 15), the overall figure for languages of all categories was 16,827 from a total number of graduates of 276,503 (6%). This goes some way to refuting suggestions that 'Firsts' are gained by International Baccalaureate students in their naturally stronger areas, namely home languages.

2) The figures highlight the trend in the HESA data, regarding a higher level of degree classification, when measured by proportion of students receiving a 'First'. As this is the gold standard of British universities it seems pertinent for the purposes of this study to discuss this phenomenon; noting that further quantitative evidence is available from the university admissions personnel in the form of the ratings questionnaire.

What the figures show is that 10% of students obtained a 'First' in 1999.

The overall proportion of 'First' degrees earned by Advanced Level students was 7%. This differential is not statistically significant taken alone, bearing in mind the sample size, however when combined with the previous two years, we can begin to support hypotheses relating to the reasons behind this differential.

Whilst doing so however, it must also be borne in mind that universities have been criticised for their inconsistencies in standards in awarding degrees, and of relevance are the origins of degree awards, pertinent to the discussion, particularly if some universities award Class 1 degrees more willingly than others and it can be shown that International Baccalaureate students are targeted, or themselves target, these universities. Though he was not specifically studying the award of 'Firsts', Chapman (1996) did point to a mis-match in the types of degrees awarded and the quality of the student:

*Some (departments) displaying consistently counter-intuitive combinations of above average entry qualifications and below average proportions of good degrees (and vice versa). These results have implications for debates regarding standards in UK universities (251).*

What Chapman found were discrepancies in the awarding of degrees with regard to the intake of Advanced Level student points tallies; his studies of over 250,000 graduate records reveal:

*“Systematic and persistent variations in the pattern of degree awards between departments which are only slightly explained by differences in the quality of their entrants as measured by A Level scores” ( 262).*

This may have consequences for the trends above regarding superior performance of International Baccalaureate students in consistently gaining a Class 1 degree. If it can be shown that International Baccalaureate students are able to 'choose' the universities on which this study casts doubts regarding assessment legitimacy, then the whole concept of a more highly performing 'end product' appears more tenuous.

The evidence appears not to favour this possibility however; International Baccalaureate students are consistently accepted in all UK universities. The main registration booklet printed by UCAS (University Careers Advisory Service), has the International Baccalaureate points requirement for all UK universities and it seems unlikely that the target for universities that Chapman highlights would be only IB students. In addition, when we look at the points requirements for universities later in this chapter, correlated to mean scores in the respective curricula, it is evident that the UK university entry system does not unduly favour either cohort. In fact, evidence will show that it may be argued that International Baccalaureate students face a points disadvantage at some of the ‘newer’ universities.

In conjunction with the ‘ratings’ questionnaire applied to university personnel, and in view of the trends in degree classifications noted above, it was deemed necessary to attempt to study the area with an added qualitative approach, Robson (1999) stated that precise terminology has an advantage over more open- ended questions due to the greater ease with which results can be interpreted and, as the study has shown, the ratings questionnaire did raise some pertinent student differences. It was decided to add an interview, enabling the respondent to answer in his or her own terms. The interview was with a member of the advisory panel of the Independent Schools Counselling Organisation (ISCO) and concerned the case study school, Oakham and university entrance in general. The advantage to relying on more than the questionnaire was cited by (Cohen et al 2000) as gleaning important information which may not otherwise have come to light. Ratings scales allowed for some differentiation of response, as we have already seen, but this additional approach hoped for greater insight into the roots of the perceived differences (see Chapter 5).

As with other areas, it was adjudged that the personnel involved in the study had the necessary background understanding to recognise the particular attributes that students in Higher Education require in order to ensure a higher degree of

attainment/ success. Accordingly, the study concentrated on the admissions and teaching sectors. As these make qualitative decisions on a regular basis, a high degree of reliability is inherent in the respondent choice.

## 2.4 University Entry Points Study

In order to triangulate the evidence collected from the Higher Education establishments, it was necessary to consider a quantitative comparison, in the form of a study of twenty-nine British universities and their entry points requirements for graduates of the respective curricula. If it could be established that there is a parity of points offered, then the relationship may offer further insights into the issue of university entry, and certainly into whether any of the cohorts were seen 'differently', as measured purely by points requirements. As the ratings questionnaires had concentrated on Economics (BA) and Biology (BSc), it was decided to choose the universities who offered these disciplines. Many offered Economics as a BSc and these were immediately discounted. The University Clearing and Advisory Service (UCAS) (1999) booklet offered 205 universities in England, Scotland, Wales and Northern Ireland; 185 of these offered the subjects required. Once again, using Word Excel, a random sample was generated comprising 15% of this total (29 UK universities). A points tallies table was then constructed (see Appendix 5) and graphs drawn.

The study was open ended at this point, with no recognised reason to look at the points totals, except that they are the given quantitative base of comparison on which all university offers are made. Thus they are the one ready means of comparison on how the universities perceive the two curricula in comparative terms. It was felt that if no easily recognised points correlation could be found, then it would indicate a high degree of uncertainty regarding the qualities of the International Baccalaureate cohort (specifying the IB, rather than the Advanced Level cohort, because it was felt that the greater numbers of Advanced Level students would necessarily provide the points bench mark, rather than vice versa).

The interesting data from the university study (see figures below) serves two main areas of analysis:

- Points discrepancies between subjects across the two curricula
- Points discrepancies between universities across the two curricula

In analysing the figures, there is a marked correlation and consistency between points requirements over the two curricula in the majority of cases. The recognition is uniform, with some exceptions that the International Baccalaureate Diploma has parity of esteem as far as university points requirements are concerned. It is evident however, that economics International Baccalaureate students have a comparative advantage over their Science counterparts when it comes to applying for university. The mean difference of economics points requirements between Advanced Level and International Baccalaureate is 8.86, whilst that of Biology is 10.00.

Standard Deviations are similar across both subjects at 4.04 and 4.8 (Economics/Biology) for Advanced Level and 2.75 and 2.8 for Diploma. This supports the earlier study on university personnel, who judged the differences in university curricula cohorts much more positively in the Arts and Humanities than in the Sciences. The fact that International Baccalaureate students must obtain disproportionately higher grades than their Advanced Level counterparts, when compared to the economics requirements would seem to suggest that the Diploma students face a relative disadvantage when applying to university Science courses.

The use of a points correlation across all the universities is an interesting concept, as the differences across many universities seem to signify that departments have discussed the merits of each of the curricula and ‘weighted’ their decisions based on perceptions of curricular difficulty, or historical experience of the cohort, or other suchlike factors. The other alternative is that they were merely guessing and after almost 30 years of teaching Diploma graduates, this is highly unlikely. The results then are important in that there is an implied acceptance that the Diploma Programme does compete on equal terms with the Advanced Level programme, with a few surprising exceptions.

The universities studied (X Axis) were:

- |                   |                   |
|-------------------|-------------------|
| 1) Aberdeen       | 16) Leicester     |
| 2) Aberystwyth    | 17) Luton         |
| 3) Birmingham     | 18) Newcastle     |
| 4) Brunel         | 19) Oxford        |
| 5) Central Lancs. | 20) Plymouth      |
| 6) De Montfort    | 21) Queens        |
| 7) Dundee         | 22) Reading       |
| 8) Durham         | 23) Sheffield     |
| 9) East Anglia    | 24) St Andrews    |
| 10) Essex         | 25) Wales         |
| 11) Huddersfield  | 26) Ulster        |
| 12) Keele         | 27) Warwick       |
| 13) Kent          | 28) Wolverhampton |
| 14) Lancaster     | 29) York          |
| 15) Leeds         |                   |

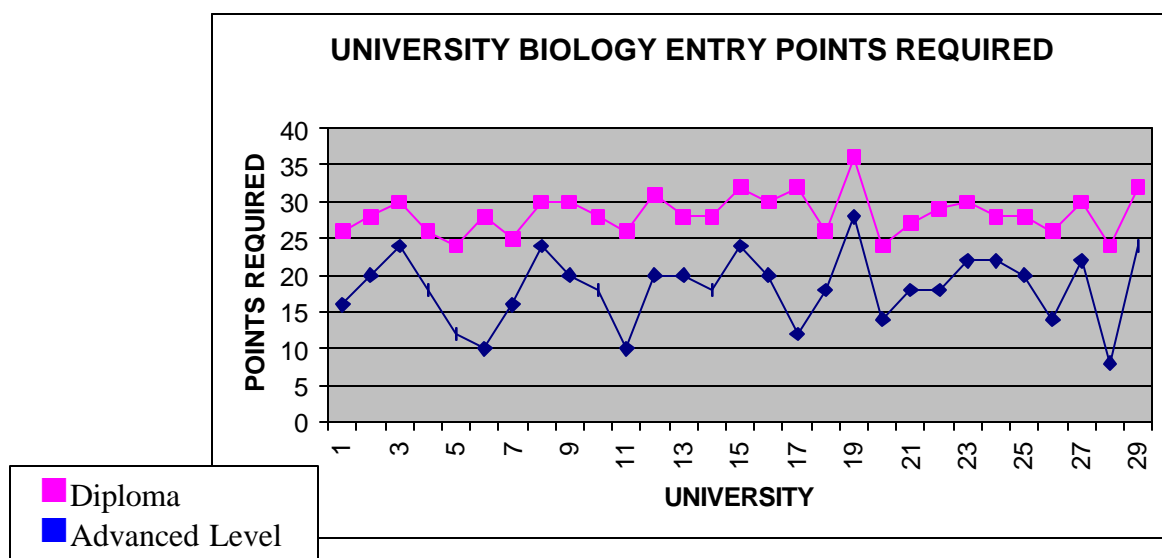
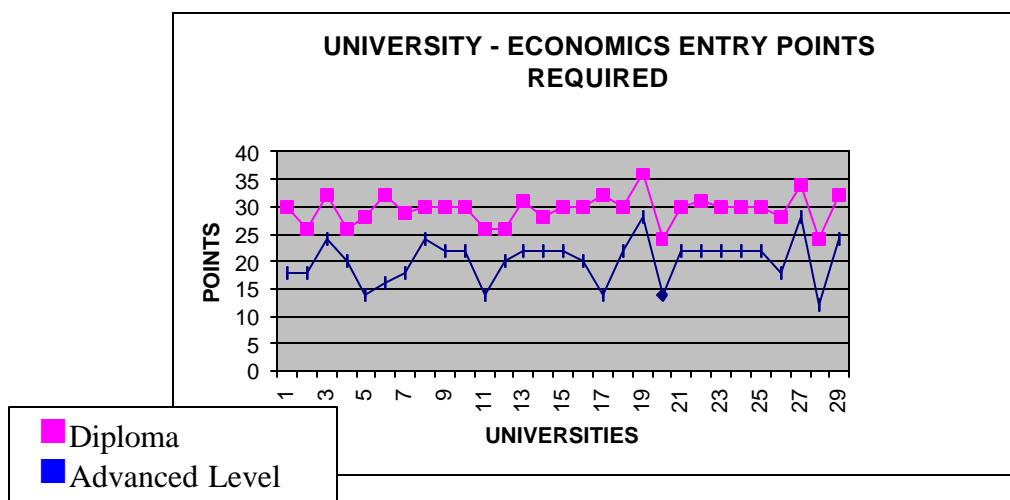


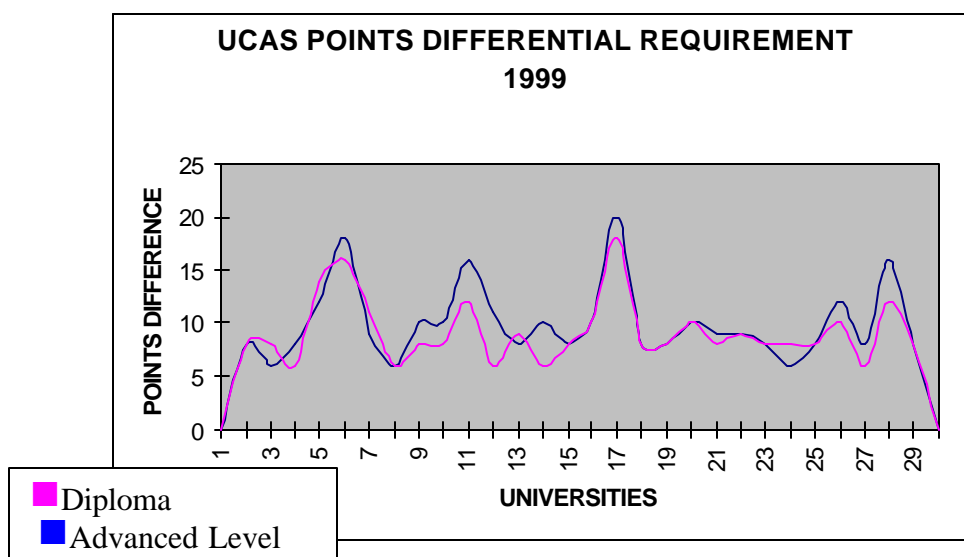
Figure 2.4 University Entry points requirements for Biology 1999





*Figure 2.5 University Entry requirements for Economics 1999*

Figures 2.4 and 2.5 highlight the high degree of entry acceptance parity between curricula, but figure 2.6 (below) does show some interesting anomalies. In studying the points required over the 29 universities, discrepancies are noticeable at some universities. Universities numbered 5, 6, 11, 17, and 28 all show marked increases in points requirements for International Baccalaureate students over both faculty areas. Interestingly these universities are: Central Lancashire, De Montford, Huddersfield, Luton, and Wolverhampton. A marked common feature of these universities is that they are all ‘new’ universities, formed in the early 1990’s when polytechnics became universities.



*Figure 2.6 UCAS Points differential requirements over Economics and Biology*

This is significant in terms of the study because it has implications on the choice of institutions by International Baccalaureate students; it implies that they are being forced in the direction of the longer established institutions that are making points offers more in line with the attainment standards of the students across both curricula. Alternatively, it may be argued that the ‘new’ universities making the higher points offers are doing so because of a perception or evidence that the International Baccalaureate students are relatively less likely to succeed at these particular institutions. As the latter is not supported by any evidence, and it is certainly not the perception of these universities’ admissions personnel in the previous ratings study, we must assume that the anomalies are due to lack of background knowledge of the International Baccalaureate qualification.

In a study undertaken by Beck and Drennan (2001) the five universities mentioned above were all shown to be receiving only a small amount of their income from research initiatives, ranging from 0.91% to 2.90%. The authors attributed this to structural barriers and also pointed to the problems it poses for student choice:

*While economically the concentration of research funds in the hands of ‘top’ institutions may well represent an efficient means of allocating funding, it must ultimately raise serious political questions. Today ‘post 1990’ institutions are at the vanguard of providing access to higher education to non-traditional and disadvantaged entrants. To deprive these institutions, and inevitably their students, from the benefits of these funds in the long run, cannot be a tenable position (9).*

The implications are, that as far as our research is concerned, it can be assumed that International Baccalaureate students do not attend the new universities in any great numbers as the comparative points requirements are unduly high. This must be taken as a mis-calculation on the part of these universities, perhaps borne out of inexperience, but it certainly does not signal a negative perception on behalf of universities in general. By association, it can be said that Diploma students are studying at the universities that have higher levels of research income and more

capital to invest in support structures that are able to recognise the qualities of their student cohorts. In addition, it maybe inferred that the more ‘experienced’ universities are the ones that had the time to recognise the inherent qualities of the International Baccalaureate Diploma graduates and have a dependable entry points benchmark.

There is certainly no doubt that the claim by the International Baccalaureate Organisation (2002: 2), that the IB Diploma is “*a leading internationally recognised pre-university qualification*” holds true. The points study highlights the consistent correlation between the two curricula as entry requirements to British universities. Whether the trend towards higher degree attainment has continued, requires further research, but there is much anecdotal evidence to suggest that it will. The ratings study of university personnel highlighted just which factors make International Baccalaureate students stand out in the Arts/Humanities; very pertinent in one sense because the BSc faculties do not recognise these same qualities in their Science intakes.

Admittedly, the discrepancies in intake sizes make cautioned summary necessary, but the study does provide a foundation for further research and as Diploma intakes increase, quantitative study will assume an increasingly important role. Whatever trends are established in the medium term, the present attainment levels of Diploma students, many of whom possess English only as a second language, deserve recognition, even if only based on anecdotal, or limited qualitative research. The recognition by institutions of Higher Education that the International Baccalaureate is a serious competitor to Advanced Level serves to strengthen the case of proponents of broader study. There is little to suggest that Diploma graduates face any difficulties in adapting to British Higher Education.

This macro view however, must be supported by closer study of a more specific area of the educational experience of the cohorts from both of the curricula. As a major concern of universities concerns the readiness of 18 year olds for study of a specialism in depth, it warrants close comparison of subject knowledge and understanding. Through a study of economics across the curricula, questions were raised regarding attainment in economics when each cohort is examined with the

others' examination papers. The findings it raises are detailed in the preceding chapter.

### EXAMINATION AND SUBJECT PARITY

#### 3.1 Introduction

Perhaps the most serious critical charge levelled at the International Baccalaureate Diploma programme is that breadth automatically means a dilution of standards and that the student studying six subjects and more over the two years, must necessarily sacrifice subject understanding. Thus, he or she will be less adequately prepared for further study at university. The previous chapter has gone some way in refuting this argument, but a subject comparison in economics helps to highlight how far apart (or not) curricula are in terms of subject grasp and applied cognitive abilities.

The main fear of most individuals or institutions opposing a broader curriculum for England is that it will lead to declining standards of subject specialisation. Obviously, as the curriculum broadens there is less time spent on each subject (in the case of International Baccalaureate Diploma 'Highers' the compulsory minimum is over 30% lower than that of a typical Advanced Level). Whether this leads to lower levels of understanding is an area for study. Again, because of the distinct nature of the International Baccalaureate programme being taken all over the world, a representative subject was chosen in order to make a subject comparison. Economics provided the focal point; in the main because the syllabi are so similar.

In practical terms this means that microeconomic theory is reduced to supply and demand, including elasticity and price controls, but without marginal utility and indifference analysis. The International Baccalaureate Organisation stresses what some economists consider to be lower priority areas of the subject, namely development and comparative economics. Economic modelling is given only a

minor role by the Diploma programme, avoiding the criticism that the first year at university will not simply be a repeat, a criticism of Advanced Level Economics made by Rosalind Levacic (1989: 12).

There has been concern expressed in many quarters about the nature of Multiple Choice question papers, however both curricula continue to use this format as a major form of weighting behind the final grade award. Some of the criticisms regarding multiple choice examination formats are justified: they provide no outlet for creative thought processes, they rely on time pressured responses and they are more susceptible to manipulation in a limited number of cases. Their advantages consist of ease of marking, wide coverage in time available and ease of statistical analysis. A study focused only on this type of examination format is a distinct possibility; analysis of the students selecting each of the alternative answers on a question provides information about the question difficulty. How many students answered with the same wrong response shows how the distracter questions work.

However, this study cannot use a breakdown of the questions, as the data extraction is too time consuming. It would be interesting to analyse whether the patterns of incorrect and correct questions varied with each cohort, or even across schools, but it is not essential to the study. As what are, in effect, split halves analyses, the overall scores are the defining feature of this section of the study. The trends could have been taken to analyse, but future research could concentrate on gender response, school response, even geographical variations of response.

Both syllabi chosen used multiple choice questioning papers (see Appendix 6), and had almost identical aims and objectives. The major difference between the two papers was the disproportionate amount of time spent on development economics (in the case of the International Baccalaureate) and the workings of the national economy (in the case of the Advanced level Examining board, OCR). After taking these two sections out of the final examination papers, the study was left with 32 questions in each, eight fewer than usual. For this reason, teachers were asked to cut the testing time to 50 minutes, rather than the usual hour. Other than this, both syllabi had extremely similar subject content across the whole

range of their board requirements. The means of assessment were also very similar. The major difference was that four long essay questions were a requirement of OCR, whilst the International Baccalaureate requirement was one long essay and four shorter ones. If the area of comparison had been essay writing then this anomaly may have presented problems, however, as the main means of comparison was to be through multiple choice questioning this difference was discounted (Appendix 9). It must be noted that the need for more extended writing may lead to a higher concentration of teaching on factual recall and this will be mentioned later in the study.

In a simple 'grade pairs' comparison, the study registered the mark obtained by an individual student in the International Baccalaureate examination and compared it with the mark obtained in the Advanced Level examination. If a trend is marked across a large proportion of the students then it may indicate the levels of subject understanding within the two curricula, and highlight how the difference in time allocations is translated into subject 'mastery'. This can be assessed in terms of the main extrinsic course objective, namely examination grade gained, although many would argue that 'mastery' is displayed in other ways such as assessed real life applications. Unfortunately, the value judgements associated with these are difficult to assess empirically and testing remains the dominant methodology.

The point regarding subject attainment needs discussion in practical terms; less time is given to each Diploma subject, compared to the Advanced Levels, inferring that the A Level student is able to concentrate his or her energies in a more specific way. However, it may well be that the acquisition of understanding is more complex than the time and energy variables would suggest and it is worthwhile to attempt to measure subject understanding in some way. In the scope of this study a wide- ranging examination of subjects across the two curricula was not possible, as has already been mentioned, however these economics examinations provided a useful focal point.

Quantitative measures of the subject's 'difficulty' in each of the curricula are difficult to develop, unless an objective outcome can be pinpointed. In this case the grade is an inadequate measure of the outcome, precisely because a

comparison of the grades in all subjects of the two curricula is the subject of much debate anyway. Taylor Fitz-Gibbon (1999:219) used correction factors in examination performance across the range of subjects to arrive at a definitive conclusion about relative subject difficulty. This would be useful in this study however it has never been applied across curricula, merely limited to Advanced Level. What can be attempted however, is a direct examination result comparison in the same subject that can provide us with some measure of the thought processes involved in studying for, and sitting, each examination in each of the respective curricula. This information can then be used as a basis for further research regarding the final outcome: in this case university performance.

Given the scope and resources of the study, it would have been preferable for each examination entrant to have been given a baseline reference test before sitting. In a report for the SCAA (School Curriculum and Assessment Authority), Fitz-Gibbon and Vincent (1994:12) point to aptitude tests as the means to aid fair sampling, but this is not possible within the geographical limitations set by this study. There is much to be said for this approach, particularly when the study is attempting to gauge the relative 'difficulty' of various subjects. In this particular case, where Economics is taken as the focal point, the use of a wide sample of schools, with an appropriate balance of selective and non-selective entrance requirements, identical age requirements and an extremely similar content base, initial norm referencing is much less necessary.

This method suffers from one major problem: schools who have responded to the questionnaire may not be representative of schools utilising the two curricula. To some extent the size of the sample may help to alleviate this concern. However the attempt is nothing other than purely a subject/student comparison, and thus to base inferences on subsets of 'atypical' schools would still be valid, as any peculiarities would be cancelled out across both subjects.

After studying examiner reports in the period 1995 to 1998, the decision was made to use papers on which the consensus of the Examiners was that the examination was pitched at the correct level in terms of difficulty. Though the main aim of the study was to compare marks across each student, it was still



considered desirable to use papers which were as representative as possible of the levels of conceptual and content difficulty in each syllabi. The sections containing the common areas of study were combined to make up a total of 32 questions on each paper, as previously mentioned, meaning that raw scores had to be converted to percentages whenever comparisons with previous examination sessions were attempted. All references to Examination Board were removed from the papers. The possibility that the papers had already been used for practice in the respective schools is acknowledged as a possibility. What this part of the study intended to establish was the relative preparedness of each set of students, at similar stages in their academic careers, to take each others' examinations. The aim was to establish levels of subject knowledge, understanding and examination technique, in the final year of pre-university study, and take into account the differences in time allocations in each of the curricula.

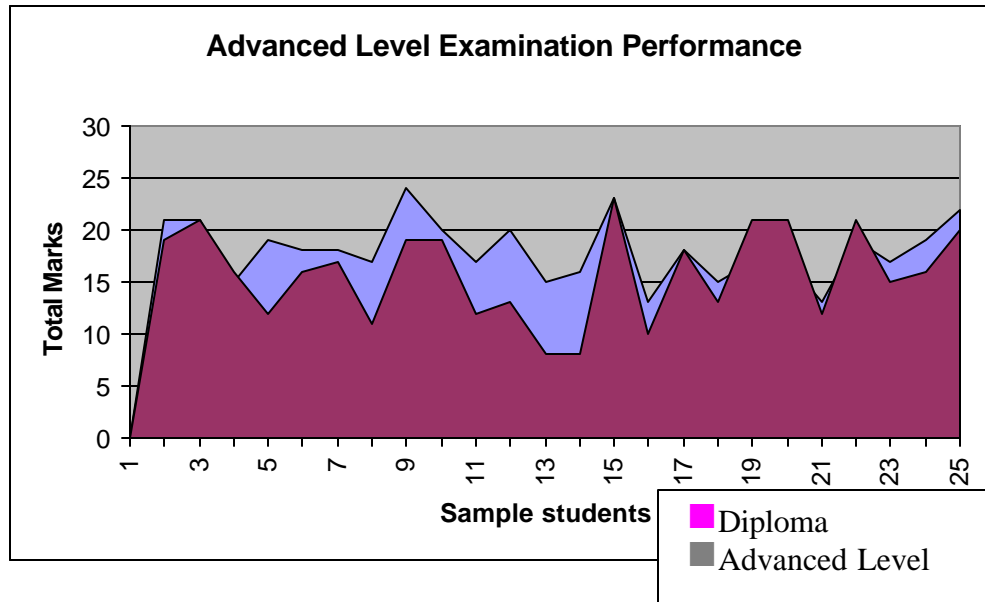
Return rates on the examinations were extremely low, even though advance notice had been sent one month before the actual posting. Packages were addressed directly to the department, as unfortunately, the lists of schools using the respective syllabi did not contain the teacher details. One month after posting the examination and questionnaire packages, the return rate was only 23% overall, slightly in favour of the International Baccalaureate schools. A reminder was sent towards the end of January 2000. This increased the overall returns rate to 43%, again skewed towards the International Baccalaureate schools (56% of the total returns were IB Diploma schools). Some hard data was required in order to begin analytical background work. From the end total of 130 International Baccalaureate student returns and the 92 Advanced Level student returns, twenty five of each were chosen through the Windows Excel random sampling facility (3x 25 populations in total).

The following section, 3.2, highlights similar levels of performance across both examination papers, by each respective curriculum cohort. There are more recognisable inconsistencies in the way International Baccalaureate students completed the Advanced Level examination paper in particular, however evidence is lacking regarding any markedly superior examination performance by the Advanced Level cohort, related to the time differential.

### 3.2 Examination Study

The tables below and overleaf show examination performance over the two curricula, firstly on raw scores, then split half.

*Figure 3.1 Examination performance comparison in Advanced Level*



*Figure 3.2 Examination performance comparison in IB Diploma*

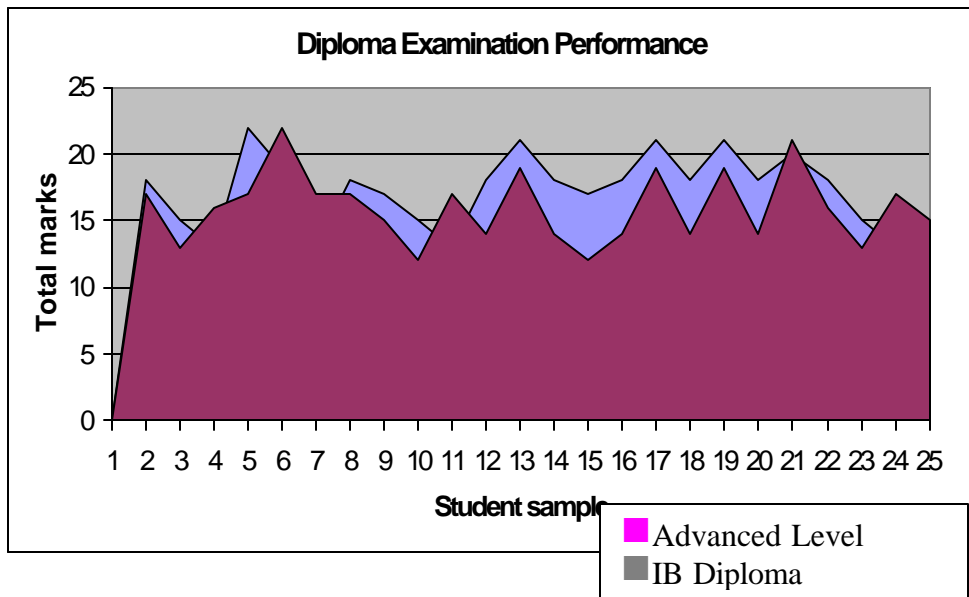


Figure 3.3 Advanced Level cohort performance (split half analysis)

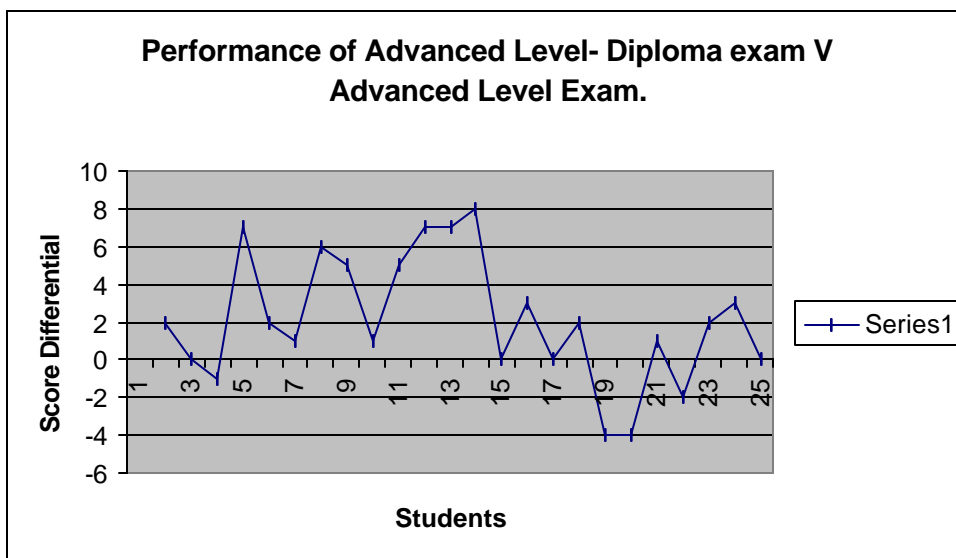
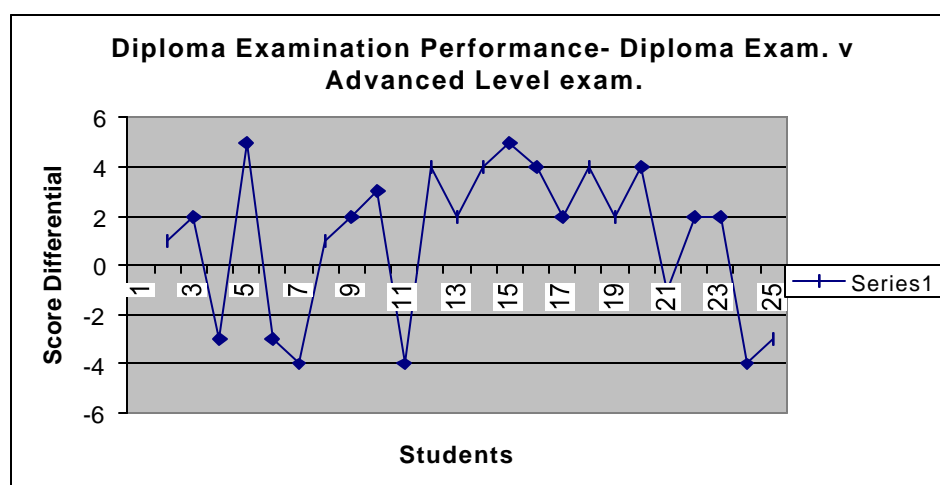


Figure 3.4 Diploma Level cohort performance (split half analysis)



The initial low rate of return can possibly be explained by the fact that many schools, both in England and internationally, have their 'mock' examinations in early to mid December and this would have needed the class time. By keeping the returns date to March, the possibility of using these examinations as a means of revision for the main examinations in May meant that the returns increased significantly. The fact that some schools had three months longer to complete the examinations was discounted due to the fact that the aim was for split half analysis to be applied across individuals and, provided there was no time lag in

each student taking each examination, the results would raise pertinent points of comparison.

What can be concluded from studying the raw data is that each cohort faces little difficulty in taking the examination of the other curriculum. With some exceptions, each cohort performed most strongly in their own examination (measured by the mean) and highlighted in Figures 3.1 and 3.2 . Figures 3.3 and 3.4 highlight the positive and negative swings between the different samples. There is no significant marked trend, and although only a representative sample comparison of the total population, the findings are interesting to note. If there is one area of significance that arises from this small study, it is that the 33% time advantage enjoyed by the Advanced Level students does not correlate in any way with examination performance in Economics. In fact, as the t test below will show, there is no significant difference in performance.

*Table 3.1 Examination performance results in the Advanced Level Examination*

| <i>Sample</i>                             | <i>Range</i> | <i>Mean</i>  | <i>Sample Size</i> | <i>Standard Deviation</i> |
|-------------------------------------------|--------------|--------------|--------------------|---------------------------|
| <i>Sample 1 Adv. Level<br/>IB Diploma</i> | <i>13-24</i> | <i>18.24</i> | <i>N- 25</i>       | <i>2.933</i>              |
|                                           | <i>8-23</i>  | <i>15.76</i> | <i>N-25</i>        | <i>4.380</i>              |
| <i>Sample 2</i>                           | <i>0-26</i>  | <i>17.25</i> | <i>N-25</i>        | <i>5.854</i>              |
|                                           | <i>7-25</i>  | <i>18.37</i> | <i>N-25</i>        | <i>2.545</i>              |
| <i>Sample 3</i>                           | <i>12-26</i> | <i>19.87</i> | <i>N-25</i>        | <i>3.326</i>              |
|                                           | <i>9-24</i>  | <i>16.34</i> | <i>N-25</i>        | <i>4.728</i>              |

*Table 3.2 Examination performance results in the IB Diploma Examination*

| <i>Sample</i>                             | <i>Range</i> | <i>Mean</i>  | <i>Sample Size</i> | <i>Standard Deviation</i> |
|-------------------------------------------|--------------|--------------|--------------------|---------------------------|
| <i>Sample 1 Adv. Level<br/>IB Diploma</i> | <i>12-22</i> | <i>16.04</i> | <i>N- 25</i>       | <i>3.429</i>              |
|                                           | <i>11-22</i> | <i>16.88</i> | <i>N-25</i>        | <i>3.100</i>              |
| <i>Sample 2</i>                           | <i>0-24</i>  | <i>15.27</i> | <i>N-25</i>        | <i>5.932</i>              |
|                                           | <i>8-25</i>  | <i>17.35</i> | <i>N-25</i>        | <i>4.104</i>              |
| <i>Sample 3</i>                           | <i>10-25</i> | <i>17.05</i> | <i>N-25</i>        | <i>3.149</i>              |
|                                           | <i>11-26</i> | <i>18.02</i> | <i>N-25</i>        | <i>3.905</i>              |

The data presented in graphical form is based around samples 1 and 3, which are judged to have come from the same population. Sample two has been modified and then disregarded on the basis of Shewhart's (1931) work on common cause variation. When the sample was first collected and analysed, it was problematic; as it showed such a marked variation it appeared to nullify the other study data and various approaches were considered. Should an additional questionnaire be sent to this particular school, requesting information about test conditions in order to account for the two main discrepancies, or should some means be found by which the data could be accounted for statistically?

In view of the low and slow response rates to previous questionnaires, the latter course of action was decided. Two of the examination comparisons in sample 2 caused such variation in the final data analysis that Shewhart's control limits were exceeded. Shewhart theorised that variation must be accounted for in standard deviation, citing a 3 $\sigma$  limit as a justifiable cut off point in any study of process. Undoubtedly, the results in sample two maybe due to special cause variation in time spans between given examination papers, or perhaps illness, or any number of possibilities. Accordingly sample two was cut from the study. As returns from a Level had numbered 92, another sample of 25 was not possible to compile, however the population similarities of samples 1 and 3 were important to this part of the study and sample population 1 is represented in graphical form. Two marks

of 22 and 23 from the Advanced Level examination respectively, from the same school, were 'paired' with zero marks on the International Baccalaureate Diploma in sample number 2. This exceeded Shewhart's special cause variation limits and the sample was disregarded.

The objective of the comparison is to assess the relative difficulty of each of the examination papers and to conclude, whether in purely subject terms, breadth necessarily means less depth, and consequently lower levels of understanding. However, the potential for further comparison also exists; we can study the margin of difference and come to conclusions about the different cohorts' performance on the other paper. This may tell us much more about the differing demands of the two curricula, in terms of skills and outcomes objectives.

Subjecting the data to split half analysis was difficult because this kind of data usually refers to analysis of the same test, with reliability measured by the consistency of answers between the two halves. As the tests were externally set by two different examination boards this was not applicable here. A similar problem arose with the test-retest method, where students take the test twice, at different times. This methodology also did not fit with the aims of the study. It was originally decided to apply significance testing to the data as the best means of analysing the data, based around the principle of split half methodology; this was admitted as methodology in the original research proposal in 1999.

The hypothesis was offered that there would be insignificant difference between cohort scores, despite the advantages in curriculum time given over to the Advanced Level cohort. In specifying the theoretical distribution of difference between means, the random sample may generate scores yielding a 'significant' difference between cohorts, in accordance with the superior time allocation. An hypothesis is therefore offered that Advanced Level students will score significantly higher than the IB Diploma students, in consequence. Using a one tailed T-Test on the generated samples 1 and 3, a 2.3 SE-diff is considered appropriate, in favour of the Advanced Level students.

Admittedly, in using a one-tailed test, there is a greater risk of Type 1 error. However, the risk has been considered and disregarded as 110 extra teaching contact hours should ensure that the significant difference would not lie in the opposite direction. Findings are listed in Table 3.3:

Table 3.3 T-Test Findings on ‘Significance’

| Sample                    | SE-diff (marks) | Mean-diff |
|---------------------------|-----------------|-----------|
| N <sub>1</sub> Advanced   | 2.43            | 2.48      |
| N <sub>1</sub> IB Diploma | 2.1             | 0.84      |
| N <sub>3</sub> Advanced   | 2.89            | 3.53      |
| N <sub>3</sub> IB Diploma | 2.22            | 0.97      |

As the differences between mean scores exceeds SE-diff in the Advanced Level paper in N1 and N3, it can be considered that it is significant at the 1% level. The findings in the International Baccalaureate paper lead us to conclude that the difference in cohort performance is not significant. The more common usage of diagrammatical questions may, debatably, cause more difficulty for the International Baccalaureate students, who do not appear to face this form of questioning as often as their Advanced Level counterparts. With analysis of individual questions, there maybe an answer to the difference in cohort performance on the Advanced Level. For the purposes of this study, it is sufficient to accept that Advanced Level performance in the Advanced Level paper was ‘significantly’ superior, but the findings must necessarily be tempered by those on the Diploma paper, which found no ‘significant’ difference in cohort performance.

### 3.3 Examination Structure

The most obvious variable in the question papers, which may lead to variation in performance, is the wide discrepancy in the use of diagrammatical questions across the two, as mentioned. One would have expected the International Baccalaureate Diploma examination to be more visual because of the second language variable, however the opposite case was true. From the 32 questions on the examination paper, 11 were diagrammatical on the Advanced Level paper, whilst there were just three on the International Baccalaureate paper. In the five comparative years previous to this, the numbers were similar:

*Table 3.4  
Comparative Use of Economics Multiple Choice Questions using Diagrams in Years  
1994 to 1998*

| <i>Year</i> | <i>Advanced Level</i> | <i>International<br/>Baccalaureate</i> |
|-------------|-----------------------|----------------------------------------|
| <i>1994</i> | <i>10</i>             | <i>4</i>                               |
| <i>1995</i> | <i>12</i>             | <i>5</i>                               |
| <i>1996</i> | <i>13</i>             | <i>8</i>                               |
| <i>1997</i> | <i>12</i>             | <i>4</i>                               |
| <i>1998</i> | <i>11</i>             | <i>3</i>                               |

In terms of significance, there is little research to draw on regarding the uses of diagrammatical questioning. Certainly, its uses in terms of learning strategies are widely documented, but in questioning how it affects examination technique, inferences must be relied upon. One of the teaching tools in many subjects with scientific method as a basis are the ‘laws’ of the discipline and it is this subject knowledge, when applied to case studies, which provides the basis for answers. Perhaps it can be claimed that the theoretical, factual underpinning of the discipline of Economics is diagrammatical and ostensibly diagrams are an easier way of learning ‘laws’ than through language. This ties in closely with many



educational observers who have questioned the way in which Advanced Level teachers teach. Edwards (1997) stated:

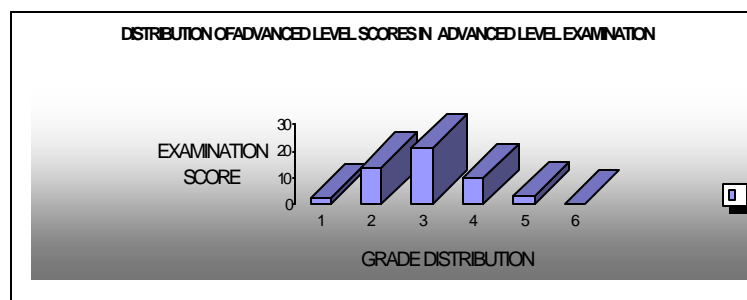
*A familiar charge, exemplified in the Higginson report of 1988, is that A Level examining gives students too much credit for their ability to memorise and recall facts and arguments and too little for their capacity to exercise judgement, to reason, to stand on their own feet and think for themselves (26).*

Without doubt, diagrams have limited use for the user. They are subject to specific ‘rules’ and if a student recognises how they work then there is only a limited range of questions which can be asked. The only study available, which could throw some light on how the uses of diagrams could influence examination technique, criticises the use of diagrams over data. Bates (1989) comments:

*Data frequently serves primarily as a means of inviting the student to display his knowledge of an area- as opposed to many A level questions which tend to ask “can you interpret these tables or graphs”. The latter can apply laws to the workings of diagrams, which are usually fixed .... (170).*

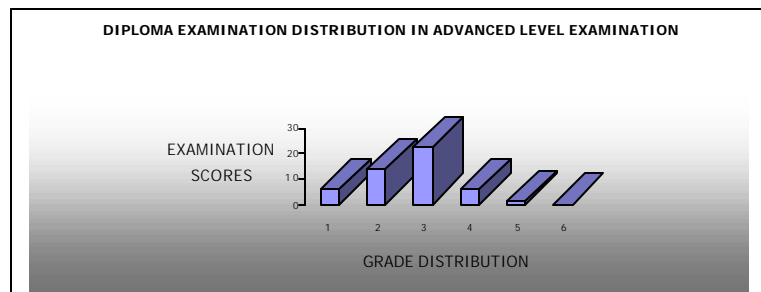
As far as the ‘representatives’ of the results were concerned, it was decided to score the papers according to the mark bands specified by the respective examiners reports. Each student was then given a grade and the grades were set out in distribution graphs:

*Figure 3.5 Distribution of Advanced Level Scores in the Advanced Level Examination*



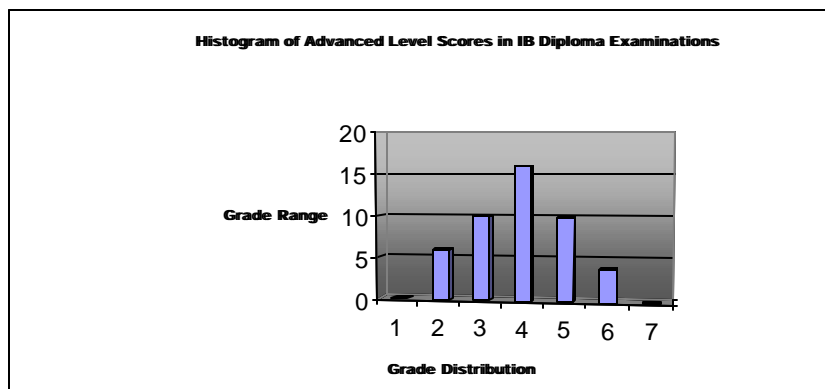
*Mark thresholds above: 1-fail 2-E 3-D 4-C 5-B 6-A*

*Figure 3.6 Distribution of IB Diploma Scores in the Advanced Level Examination.*

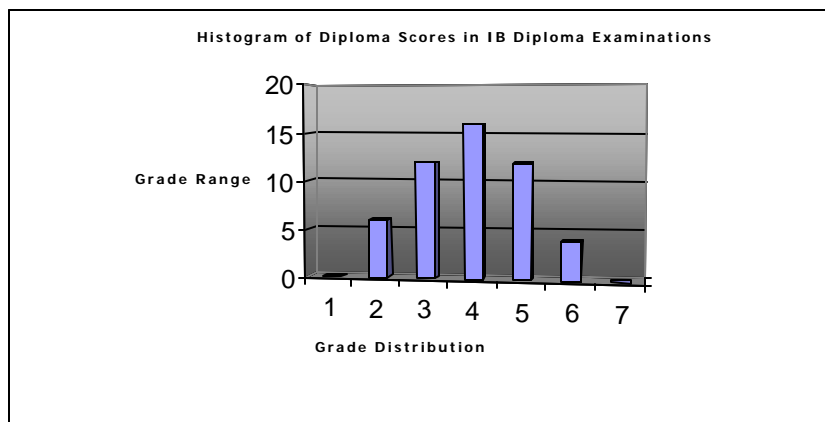


Mark thresholds above: 1-fail 2-E 3-D 4-C 5-B 6-A

*Figure 3.7 Distribution of Advanced Level Scores in the IB Diploma Examination*



*Figure 3.8 Distribution of Diploma Scores in the IB Diploma Examination*



Studies of the figures 3.5 to 3.8 show marked similarities in the distribution of scores across both examinations and across both curriculum cohorts. More importantly, they show grade distributions in line with population distributions, as specified in the examiners' reports. Average grades for the examination year used were upper '4' for the Multiple Choice section of the International Baccalaureate examination and Grade C/D borderline for the Advanced Level, translated pro-rata into national and international mean scores of 19 and 20 (from a total of 32) respectively (actual mean scores were 23 and 24 from a total of 40).

The use of multiple choice format can lead to a deluge of statistical data, and indeed it would have been a useful exercise to compare and contrast examination data on the different curricula across the various topic areas. The study did not require this to be done, as it is attempting a quantitative performance comparison. The data highlights a normal Gaussian distribution, with little sign of any abnormalities; 40% of the Diploma scores fell between the mean and the mean plus one standard deviation on the Diploma examination. Similarly, the figure for the Advanced Level cohort was 17%. In the Advanced Level examination, the figure for the Advanced level cohort was 24% and that of the Diploma cohort 36%. Scaling the scores in this way allows us to analyse where each student stands in relation to the overall demands of the examinations, but more importantly to measure the 'quality' of the respective examinations by comparing the range of scores across the standard deviation. In general, the tighter this ratio remains across students and their paired examinations, the more similar the difficulty of the examinations set.

In the case of both cohorts, over both examinations, there are few marked differences in the examination results. In both examinations, the International Baccalaureate cohort did register a slightly more inconsistent approach to the examinations, evidenced by the higher difference in mean scores in both of the papers.

### 3.4 Summary

Apart from this, building on other studies, this study highlights the many similarities in the way in which both curricula cohorts approach subject content. Considering the recommended contact time discrepancy between the curricular cohorts, there is little evidence to suggest that study in ‘depth’ has a marked effect on subject understanding. Bearing in mind the diagrammatic variable noted earlier in the chapter, there is reason to propose that the marked time advantage could be passed to another subject for the purpose of broadening subject choice, without too much loss of subject grasp. Admittedly, this conclusion is drawn on the basis of a multiple choice approach; perhaps if a selection of students were able to take the full examinations in both of the syllabi, a truer picture would emerge.

The previous two chapters have provided a qualitative and quantitative testimony to the attributes of International Baccalaureate Diploma students, however little explanatory definitive research has been provided. The research points to differences in cohorts’ university preparedness and substantiates this with a study which finds little difference in subject grasp, despite substantial time allocation discrepancies, but it offers little on the didactics behind these phenomena. A study of teaching and learning is intended to highlight reasons how and why curriculum structure can affect educational outcome and help to position the curricula in the context of current teaching and learning theory.

### AN ANALYSIS OF TEACHING AND LEARNING

#### 4.1 Introduction

Central to all educational process, and the result of numerous studies, is the relationship between teaching and learning. The problem statement asserts that International Baccalaureate Diploma, due to the study of more subjects over the same time allocation, are assumed to have a weaker grasp of the learning process than their Advanced Level counterparts and to approach a study of this contention the central focus must be on teaching and learning differences. We have ascertained that, in Economics at least, the loss of 33% of teaching and learning time had little marked impact on how a cohort of IB economics students performed in comparison with Advanced Level students. In a limited way, this refutes the argument that breadth must necessarily mean that understanding in depth is sacrificed. Bearing in mind the need for caution regarding sample composition, examination methodology and suchlike, this is an extremely interesting finding, particularly if we include the results from the Higher Education admissions policies and the opinions of university personnel.

The International Baccalaureate Diploma student suffers no academic 'short changing' from the programme, moreover he or she is seen as a student of higher education with study qualities noticeably different from their Advanced Level counterparts. The obvious course of action is to investigate this and attempt to relate it to teaching and learning process in the International Baccalaureate Diploma programme.

The question of the 'quality' of student learning is pivotal to the issue of understanding. If the International Baccalaureate represents an opportunity for students and teachers to behave and perform differently in the classroom, then we have some measure of the processes of effective learning. Edwards (1997:15)

notes that most curricula do not allow for the benefits to be gained from a wider subject choice:

*“Breadth or balance in choice may be desirable, but neither is required. Nor are tangible benefits in the assessment of students’ performance attached to their capacity to make cross-curricular links”.*

If there is a more active, cross-curricular learning environment associated with either of the two curricula then it provides an insight into the means by which understanding and knowledge are taught. If, as much research suggests, more optimum methodologies exist for understanding, then the classroom learning environment is essential. Does the pedagogy of the IB Diploma teacher make use of the assessment opportunities, which Edwards asserts is important, and does this affect their students’ approaches to learning?

On one side of the methodological divide, the 'conservatives' retain the belief that academic knowledge and the teacher, the expert in a particular field, best passes on understanding. If it is this pedagogic conservatism which structures a curriculum and drives classroom practices, then the drive to reform is difficult. Alternatively, if subjects are integrated or 'lose' their importance through dilution then academic authority is undermined. The effect on the learning processes of the student is undetermined however. As far as classroom interaction is concerned Macfarlane (1993: 61) claims that Advanced Levels necessitate the *"need for a didactic approach"* in that a study in depth, with the academic and time demands involved, is a process of *"cognitive apprenticeship"*. This didactic approach was criticised by Her Majesty's Inspectorate (DES 1987b:24-27) when it called for:

*Advanced level teachers to lecture less, prescribe classroom tasks less closely, allow more scope for students' initiative and create frequent opportunities for their students to explore their own ideas rather than have the teachers' forced upon them (25).*

This would seem to be borne out by the amount of time allocated to the various subjects within the respective curricula. According to figures released by Cambridge International Examinations (UCLES, 2001) recommended teaching

time for an Advanced Level over the two years of study is 360 hours. The recommended teaching time allocated to the Higher subjects in the International Baccalaureate Diploma is 240 hours. This difference of one-third is not reflected in any figures on final attainment output, as the studies of degree classification and the admissions personnel show.

Her Majesty's Inspectorate's (HMI's) concentration on the largely didactic nature of Advanced Level teaching is indicative of the fact that such teaching style may lead to examination success, but omits many of the requirements of an effective education. The HMI report (DES 1987b:22) commented on the:

*“Narrow interpretation of the syllabus leading to over-directed teaching and too much passive receiving of facts”.*

This emphasis on knowledge acquisition can arguably affect understanding, but more importantly, the way in which each subject specialist passes on information seems a major limiting factor in creating a balanced learning environment for the student. As will be discussed further, how students learn is a subject of widespread contention, however their exposure to different teaching styles over a range of subjects may be a primary consideration and the major variable in the Diploma teacher/student relationship. If student learning styles are influenced mainly by the composition of the different teaching styles facing them, then we have a basis on which to investigate the study's earlier findings. If pedagogy is unaffected by the curriculum, then this too will shed light on the debate between breadth and depth.

## 4.2 A Study in Teacher Methodology

In search of a means to determine whether the teachers within each system took a different approach to the teaching of subjects, it was decided to use a combination study, taking data from a study already established in England and Wales. The ALIS (A Level Information Systems) project is a system set up for the evaluation of teaching and learning within the Advanced Level curriculum. Each year, approximately 86,000 questionnaires are sent out to Advanced Level students, requesting information on teaching and learning, as well as studying final examination results and comparing them with previous levels of attainment.

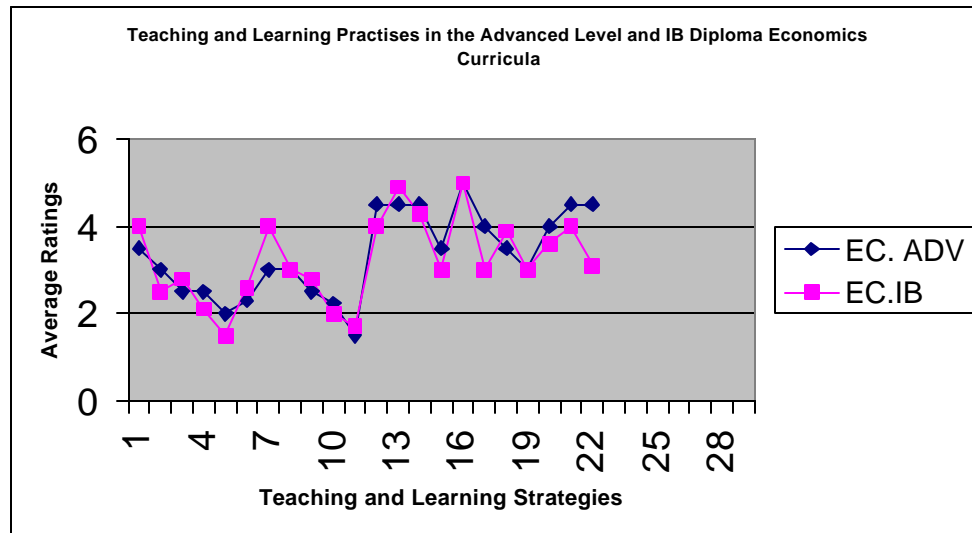
Created and run by the Curriculum and Evaluation Management (CEM) centre at the University of Durham, these studies have been ongoing for over 10 years. The data bank is large, however for the purposes of this study, unfortunately limited only to Advanced Level. Permission was given by the staff at the CEM centre to use their research work as a basis for this part of the study into teaching comparisons between the two respective curricula. For the examination comparison section (see Chapter Three) a random selection of twenty five schools (see Appendix 7 ) from each of the curricula received requests for information. Primarily, the study required them to set their students two multiple choice Economics papers and note the results and complete a questionnaire regarding the subject importance of economics to their future aspirations (this latter issue will be discussed in the later chapter on ‘anxiety’). For the International Baccalaureate students, an extra questionnaire was added, requesting information on the teaching and learning which occurred within their Economics class. The study already had access to Economics teaching and learning information from Advanced Level students, courtesy of the CEM centre. What was required was a ready means of access to how International Baccalaureate Diploma students perceived the teaching methodologies employed within the subject.

The questionnaire sent out to students was based on the ALIS questionnaire (Appendix 2) Based around 22 teaching and learning activities, the questionnaire was designed to study student and teacher behaviour within a specific subject, but also make it possible to look across subjects and compare and contrast this student



and teacher behaviour. The return rate was initially 28%, increasing to 43% after a second letter was sent to students who had not returned the questionnaire. The categories for study on the X axis are listed below:

*Figure 4.1 Teaching and Learning in Economics in Diploma and Advanced Level*



- 1) *Producing original work- an attempt to see what proportion of lesson time was spent in*
- 2) *Receiving individual work from the teacher- what proportion of teaching time is taken up in this activity*
- 3) *Receiving help from another student- one of the major ways of retaining information is to teach someone else that idea or concept*
- 4) *Giving help to another student*
- 5) *Listening to another student presenting work- a learning strategy with practical applications*
- 6) *Presenting work to the class*
- 7) *Working in pairs*
- 8) *Researching a topic*
- 9) *Making use of IT*
- 10) *Using audio or visual materials*
- 11) *Doing practical work*
- 12) *Using duplicated notes*
- 13) *Making own notes from lesson*
- 14) *Having notes dictated*
- 15) *Having discussions in groups*
- 16) *Having class discussions led by teacher*
- 17) *Reading*
- 18) *Preparing essays or reports*
- 19) *Working from previous exams (under exam conditions)*
- 20) *Working from previous exams (with help)*
- 21) *Working through examples*
- 22) *Having a topic presented by the teacher*

(ALIS 1999)

The surprising feature of the study is the similarity of teacher and classroom interaction across the two curricula. Almost uniformly similar methodologies are employed, according to this sample. Surprisingly, the means of preparing the students for Economics suggest a common teacher approach, perhaps defined by

the nature of the subject itself. Hardman and Mroz (1999) suggest that all subjects have common 'themes':

*It (classroom interaction) is dominated by teacher led-recitation..which consists of three moves: an initiation, usually in the form of a teacher question; a response, in which a student attempts to answer the question; a follow-up move, in which the teacher provides some form of response (283).*

What is less widely studied is how these stages provide a basis for subject differences, according to the emphasis placed on each. For example, literature teachers spend more time on stage two, the response and allow much more "classroom discussion"(283) , whereas much more "teacher-led recitation" (283), or stage one, is prevalent in the sciences. There is obviously no one correct methodology in teaching, with many theories advocating a particular approach, with explicit means of raising student achievement and understanding being widely documented. Medway (1991) and Wahlberg and Haertel (1997) write about the effectiveness of peer tutoring, for example, both for the tutor and the tutee. Tutors develop the need to organise ideas and become conscious of managerial and social skills. As the graph shows, there is no discernible difference in the frequency of tutoring opportunities. In other studies, particularly a study by Waxman and Walberg (1999:32), the use of group work is cited as a direct means of cutting down on whole class instruction, giving the opportunity for students to engage in group problem solving exercises and thus, it is argued, learning how to 'plan, monitor and evaluate'.

Once again, however, the study shows minimal differences between the two. If, as this whole study has shown, universities express a view that the International Baccalaureate student has a improved grasp of learning processes by the time they arrive at university, the hypothesis that it may arise from more liberal teaching or different methodological practices, does seem to be without foundation. This certainly seems the case in Economics, but may not be in other disciplines.

The study did not ask the nationality of staff however, as the random selection of the Economics questionnaires was taken from a list of English medium

international schools, it can be safely said that the bulk of the teachers in the study were English first language speakers. If they were trained in Britain, then the natural conclusion would have to be that they have merely transferred the didactics of Economics teaching in the Advanced level system over to the International Baccalaureate system. If this is the case, it would clearly explain the similarities in the study, but gives us no clearer indication of how the Diploma does seem to affect students' learning strategies. If the factors are not explicitly inherent in the syllabi of the subjects themselves, then we must study the 'hidden curriculum'.

Without large -scale observations of the classrooms, it is difficult to witness the interactions between teacher and student; we must use other methodology to ascertain what the ALIS/ IB questionnaire cannot. If we acknowledge that the questionnaire represents 'how' the subject is taught, and the syllabus outlines represent 'what' is covered, we can turn to the 'why'. Studies have shown that teaching strategies, which acknowledge the 'relevance' of a subject or topic, are extremely effective. In this case, the issue could not be covered by the questionnaire and thus quantitative data is absent. Issues such as linking ideas with previous lesson content, or with other subjects, are difficult to quantify, let alone formulate questions within questionnaires. Studies on 'advance organisers' have shown that understanding sequence or continuity or overall concept mapping, can be extremely motivating. If students simply learn one isolated idea after another, the subject matter may appear arbitrary, with the explicit reward of examination success the only objective. To be able to 'see' how what is being learnt has a relationship to problems within other disciplines and the world outside education has no scale of measurement.

### 4.3 Student Learning

In a qualitative sense however, we can begin to approach this area of possible research by reference to the vast amount of studies on what constitutes effective learning. Gardner's Theory of Multiple Intelligences for example, challenges traditional thinking on curriculum design, in which ability in school can be measured by very specific IQ testing, and hence subject offerings and choice can be targeted around a certain approach in logical thinking skills. The 'hidden' curriculum –how students see their place within the overall curriculum structure, how important intrinsically is a subject if it can be linked to their construction of the world- is a vital component of understanding, and yet is probably the most neglected. Nixon et al (1996) assert that relevance is a primary variable within the learning process; individuals needing linkages, connections and disconnections on a wide ranging scale, in order to take full advantage of the information the brain needs to process.

All students learn at different rates and need a variety of strategies and guidance before learning becomes meaningful to them. The results from different sectors seem to suggest that IB Diploma students generally appear to cope better with their university courses than their A Level counterparts. The reasons for this could be very simple; it may be that Diploma students had a cultural advantage to begin with, or it may be that the study is not sufficiently wide to be able to prevent bias developing. Most international comparative studies between countries make little allowance for cultural differences so we cannot allow this argument to develop too much. For example in the International Maths and Sciences studies, which take place annually, random selection of participating schools is the norm across 15 countries due to problems associated with resourcing pre-test questionnaires Harris (1997).

There may be another, more qualitative-based reason behind the apparent success of the Diploma students. In a review on learning strategies, Sylwester (1995) cites the key criteria to understanding and memory retention as; the degree of importance the new fact or event has in our lives, how many times the fact or the event re-occurs; the extent by which we can organise it and relate it to what we

already know; the amount of rehearsal it receives; and the cues we attach to it to aid retrieval. Simplistically, this ties in closely with the points made by Nixon et al (1996) which credits wider ranging information- gathering experiences with more effective learning and understanding, at least intrinsically. When we study the breadth of the Diploma programme and the extent to which subjects overlap and interrelate, we see that many of the above criteria are met in a programme, which promotes a wider selection of subject matter by making discipline combinations of Science, Humanities and Sciences mandatory. When compared with the A Level system, whereby the overarching trend is for students to follow similar disciplines, as we have discussed previously, many of the criteria cited above do not apply.

This is further substantiated by recent brain research, which suggests that the brain is 'programmed to forget' that which has no relevance. Hart (1999:8) suggests that the key to understanding is to stimulate the brain with emotionally stimulated methodology. The key idea here is that if information is didactically presented then the brain is more likely to reject it. If memory and understanding are indeed stimulated by emotions leading to chemical reactions then the implications are enormous for all levels of schooling, but particularly for 'high stakes' examination-led systems. If the necessity is to engage in class room practices which do not stimulate the emotions then lower levels of memory retention and thus overall understanding will occur. In other words, if the educational structure engages mainly extrinsic motivations then it will most likely be an abstracted cognitive process, not an evolving set of social relationships and inter-connected experiences. Whilst this study is not claiming that International Baccalaureate teachers use methodology consistent with 'stimulating the emotions', it can be claimed that students who can make more natural, 'relevant' connections are more likely to see the use of different aspects of knowledge and understanding and hence gain a more intrinsic motivation for their studies. As we have previously seen, the HMI criticisms of Advanced Level curriculum relate to teaching small, specialised pockets of information with a view to examination success. Hardman (1997) cites:

*The pressures to get through the syllabus and cover the required material often meant over-employment of teacher-directed methods at the expense of creating opportunities for students to take more responsibility for their own learning (123).*

Additionally, he criticised curricula which are:

*“directed towards didacticism by examinations that are narrow in what they test”*(123). Whilst not advocating the viewpoint that broader-based curricula enjoy different pedagogy, Hardman recognises the disadvantage of a narrow focus of study. Although the IB Diploma is subject to the same examination pressures as Advanced Level, it may only contain the ‘narrow’ perspective in subject specific cases; the mandatory ‘broader’ structure ensures that much of the learning research findings regarding how the brain works, is more readily accommodated.

Pert (1999: 11) reinforces some of the general criteria for effective understanding put forward by Hart (1999). She suggests that different types of memory are stored in various parts of the brain. When a student attempts to recall information then the more parts of the brain used to originally store the information, the easier it is to retrieve. In simple terms, the teacher who uses multiple experiences in order to aid understanding is giving the students' brains the opportunity to store that information in more than one area. If a simple concept is initially explained through experimentation and then a lesson is offered to a peer group class, the concept has been reinforced and stored through two different methods. Many teachers, working within time pressures imposed by an externally set curriculum, do not teach towards ‘multiple experiences’, but rather towards content coverage and examination success. Could it be claimed that multiple, cross-disciplinary curricula perform this function even to a limited extent?

Many studies have been advanced regarding examination-led teaching methods that could be claimed to run counter to Plutarch belief. The majority of the studies have found that the teacher 'dominates' the exchanges between teacher and student(s) and that some studies (Blank, Rose and Berlin, 1978) found that this is an effective learning tool, provided the questions were open and demanding. The use of 'why' questions are recognised to be valuable in that they develop the skills

of speculating and hypothesising and the option to move outside the discipline as random thought processes are set in motion. Nutthall and Church (1973) found that teacher use of specific, closed questions led to more rapid learning of factual information by the students.

The study of teacher methodologies suggests that, naturally, content heavy syllabi present greater time constraints to the teacher and thus a tendency to equate factual information coverage with effective learning. If it is assumed that the ALIS study is sufficiently rigorous and wide ranging to prove that teachers do not use different teaching methodologies within the two curricula, or that different disciplines appear to stick with the 'tried and tested' methodologies, then relating this to the work by learning psychologists is vital. Cognitive research findings of recent years may also help to define the variables inherent in educational effectiveness studies.

Although the evidence that suggests that teaching methodologies vary little between the same subjects in the respective curricula, the effects of interdisciplinary study could be cited as a major variable in learning. In the pursuit of information, does the Advanced Level curriculum, in economics at least, imply serious omissions in the learning process and is this what universities are recognising? This study is not claiming that Advanced level students know less than their International Baccalaureate counterparts, but 33% time advantage is certainly not being translated into knowledge and understanding levels consistent with what one would perhaps expect if the advocates of 'depth' over 'breadth' were to be proved correct.

Gardner (1991) argues that a teaching methodology that encourages a challenge which is greater than mere regurgitation is an invitation for the student to reflect more on the significance of the event/procedure, to become more analytical of the whole issue and to gain more effective control of his or her learning. Again however, there is little to suggest that this is the case, in economics at least. Evidence of the role of the teacher as a facilitator does seem to be lacking in both examination-driven curricula. This results in other areas of weakness; processing semantic information is relatively new in the brain's evolution, our ability to

remember language-based information is not as refined as other processing areas. Hence the need for emotional stimulus is also cited in by Joseph LeDoux (1996). He explains that the amygdala, the emotional centre of the brain, processes signals to the hippocampus, known to be important in laying down new memories. The stronger and more varied the means of presenting information, then the stronger the signal from the amygdala to the hippocampus. If teaching excites, motivates and demonstrates the importance of this new knowledge to the student then it is more likely to lead to an enhancement of the student's memory of it. The inference once again is: could cross-disciplinary study raise student awareness of the intrinsic value of subject knowledge and understanding?

The aim for the majority of 16-18 education is to prepare the respective student for Higher Education. Whether the student specialises in depth between the ages of 16 and 18 may well determine his or her final degree classification. The factors behind whether a student feels as though they have benefited fully from their school education were highlighted by Haberman (1986:145) as: involving students in issues they regard as vital, engaging students with explanations of human difference, helping students to see major concepts, big ideas and general principles and not merely engaging in the pursuit of isolated facts, immersing students in the application of ideals such as fairness, equity or justice, involving students in real life experience, and empowering students to reflect on their own lives and realise how they have come to believe and feel as they do.

Although this study has already highlighted that there seems little methodological difference between the teaching of economics in both curricula, it does not necessarily mean that the outcomes listed above do not or cannot arise from the basic structure of schooling- the 'hidden' curriculum. It could be argued that a broader curriculum must automatically fulfil the demands of many of the above, but to what extent is difficult to judge without reference to data.

The concept of 'high stakes' examinations must also enter into the comparison. If it can be shown that the concentration on fewer subjects actually increases the importance of those subjects extrinsically to both students and teachers; the former in terms of university entry and the latter in terms of performance



accountability, then will that not lead onto a different approach to study and teaching? Common experience would suggest that students might not be able to comprehend and assimilate what has been taught because they lack the means to 'connect' to other relevant areas. The concept of the brain being 'programmed to forget' that which has no relevance is a vital concept if the teaching relies too much on demonstration, for example, or is content heavy. If curricula approaches are 'high stakes' then the teacher demonstration is more common, there is less 'hands on' experience for the student and the coverage of content is the primary goal

Integral to the International Baccalaureate Diploma programme is the issue of the degree of Teacher/ Learner input into the teaching/learning process. 'Learning how to learn is vital to the philosophy of the programme. The addition of Theory of Knowledge is an attempt to aid students in recognising the inter-relationships between subjects, to relate what they have learned to personal experiences, to understand and apply logic. Does the Theory of Knowledge programme change student approaches to their own learning? Does the fact that a student must complete a 4000 word extended essay give the student more confidence in the learning process? The aims of this subject, mandatory to all International Baccalaureate students, form an overview of the whole curriculum and it attempts to place the various subjects within spheres of knowledge, linked, not separate from each other.

This approach mirrors the theories of Vygotsky and Bruner, which places informal teaching and social interaction as integral to the learning process: *"Learning how to learn and how to think things through arises from social interaction"* ( David Wood, 1988: 82).

They disagree with Piaget's belief that concrete operational competence leads to the development of an understanding of the whole range of related phenomena Wood (1988). The constructivist view is an amalgam of the above and, specifically targeting education, Ducret (2001:159) asserts that young people need much more than the *"traditional and transmissive system which now exists"*. Brunner (2001) supports Ducret's call for change:

*Schools can no longer go on operating as though the aptitudes they are seeking to develop and the forms of learning to which they give rise, or the kinds of intelligence they subscribe to students, can be limited to the expectations formed during the Industrial Revolution. Technological change and liberalisation leading to a knowledge based global economy again necessarily reopen the question as to what capacities and skills societies should teach and learn.. there is need for greater flexibility and for attention to pupils' individual characteristics; the multiple intelligences of each one have to be developed” (139).*

Though the different schools of thought are mainly based on the studies of younger children, they also figure largely in the post 16 curricula, where new subjects and concepts are common occurrences, and where the brain continues its emotional and intellectual development at a particularly rapid rate. In a research project (1999), Bradmetz studied the cognitive development of 62 children until they were 15 years old, when he applied cognitive ability tests, including the Inhelder and Piaget Science test, which measures formal thinking processes, recognised as extremely important to further and higher education. Bradmetz discovered that only one child out of the total 62 proved capable of formal thinking. Though a limited sample, it is pertinent that development of thought process is not static at this time, and the post 15 educational stage is arguably as vital as any other in the development of a student's cognitive development.

Piaget's general theory (1949) is the basis on which many curricula are built; if local expertise is acquired then students are able to transfer what they learn from one area into another and their whole learning process is enriched in the process of gaining competence in one domain. Wood (1988) argues that Piaget's theory does not fit the facts and that no clear-cut evidence has yet emerged of this developmental model. He instead argues that the teaching of formal structures, in localised domains is ineffective: the teaching of facts, dates, formulae will not engender understanding or facilitate generalisations unless the student understands the intentions and purposes that motivate both the discipline and the people who teach it. Constructivism's calls for educational reform go much further than that

which exists in the International Baccalaureate Curriculum, but there are many similarities. For example, Brunner (2001) calls for:

*..the basic teaching curriculum, teaching and learning methods and technical support to education to be re-thought. Indeed there are those who advocate already that basic education should be structured, not around traditional subject areas, but around topics or themes and the skills necessary in a society where the very notions of work, employment and leisure are rapidly changing (139).*

The 'bridge' towards this approach could be seen as study across the faculty domains, and there is certainly widespread evidence about effective learning which supports cross-curricular exposure.

The context of the information, its relationship to the world as perceived by the student, the 'excitement' of the discipline, is all-important to the effective learning of the student. This approach fits the brain research mentioned earlier, where emotional stimulation was a necessary pre-requisite for effective information retention, along with the ability to find the 'hooks' on which to hang relevant concepts and procedures.

Without this 'relevance', it could be claimed that students become one-dimensional learners, specialists in one particular area of the curriculum and specialised in a certain type of information processing. As Wood (1988:84) comments:

*"The child may only learn the empty tricks or procedures"*. The study has discussed some of the implications of subject choice and curriculum composition on the learning processes of the students, but by far the most important effect on student learning is the teaching involved in the pursuit of the goals set by the respective curricula. If it could be shown that the similarities of didactics within the respective Economics curricula are mirrored in the other subjects then the study of peripheral and 'hidden' factors assume greater importance.

Many studies of educational effectiveness prompt widespread criticisms, particularly as qualitative research predominates and it has been perceived as lacking foundation in terms of scientific method. However, in terms of formulating hypothesis concerning human relationships, qualitative research is unique in its ability to highlight pertinent issues. Nowhere is this more evident than when studying research into teacher effectiveness, where the approach is teacher centred. In a study by Brown and McIntyre(1993) students were asked about the characteristics of effective teachers. The researchers then broke these down into ten categories, namely:

- *Being able to create a relaxed and enjoyable atmosphere in the class room*
- *Being able to retain discipline and control*
- *Being able to present work in an way which interests and motivates*
- *Being able to provide conditions so pupils understand the work*
- *Being able to make clear what pupils are to do and achieve*
- *Being able to judge what can be expected of a pupil*
- *Being able to provide help for those pupils with difficulties*
- *Being able to encourage pupils to raise expectations of themselves*
- *Being able to develop personal and mature relationships with pupils*
- *Being able within a particular subject specialism (28).*

There is little evidence on how effective teachers make curriculum links, apply their subject knowledge in cross curricular ways and cultivate the intrinsic understanding which Nixon et al (1996:14) termed the process:

*“Learning is becoming”.*

In other words, there are few studies on teaching effectiveness, post 16 at least, which detail successful didactics in centring the learning on the learner.

Countless studies have reflected similar findings on teaching effectiveness; Cohen (1977), Martin (1978), but not the effectiveness of curriculum structure. With reference to this study it is pertinent to ask about the relative differences in teaching methodology adopted in each of the curricula under scrutiny. Of course, some of the characteristics mentioned above are personal and perhaps, immutable. However, it could be argued that others are as a direct result of the curriculum which a teacher is forced to cover.

Could it be that the implicit teaching skills and strategies of respective teachers are ones that they have learned for the specific purposes of ensuring student successes in the Advanced Level or the International Baccalaureate Diploma Economics syllabi. Brown and McIntyre (1993) basically suggest that didactics is dictated by the pragmatics of the curriculum structure and that teacher methodology is learned in the privacy of the classroom, is rarely made explicit and becomes relatively automatic. In other words, if the curriculum has a final summative assessment, which will judge the teacher and the student, then didactics will centre around this and teaching philosophies will change accordingly and 'automatically'. If this is the case then the pertinent link back to the curricula is two stage: firstly, are student perceptions of teacher methodology different over the two curricula and, if not, as the evidence seems to suggest, does the structure of the curriculum itself affect the effectiveness of 'learning'?

Previous sections in this study have related to research on optimum teaching and learning methodology. The inference is that those particular teaching methodologies may have more success than others in students' search for self-advancement, whether through extrinsic or intrinsic motivational factors. It is evident that, as research on the human brain develops, then we will surely have to assess the teaching and learning methodological issues, which arise. The previous section showed that it is possible for students to be 'trained' in different ways with the same content. If this 'training' does not arise from methodological differences in the ways subjects are taught, as we ascertained from the ALIS questionnaire, then the differences seen in the examination study must arise from elsewhere. Most research into teaching has looked at the qualities of teachers, as recognised by the introduction to this study in the first chapter. Research studies the issues of whole class versus small group teaching, it looks at the amount of Information Technology incorporated within lessons, how divisions between task are made and suchlike. What is now becoming much clearer is that the 'hidden curriculum' assumes an extremely important role, even up to post 16 level. The Science of teaching is a complicated one. What are the most appropriate methods for teaching an Economics course to post 16 levels? In this particular study it can be assumed that these explicit teaching methodologies find agreement even across two different curricula.

There is obviously much more to the issue than simple teaching methodologies; if subject approaches are similar in Economics, as is content, then the discrepancies in time allocated to each syllabus and the peculiarities of how each sample of students performs in the other sample's examination need further study. It could perhaps be argued, that the differences which constitute the 'hidden curriculum' of teaching and learning derive directly from the structure of the explicit curriculum, rather than from any differences in teacher pedagogy, subject aims and objectives or subject content. Whilst acknowledging that the focus is on only one subject, it is pertinent to report that recent studies increasingly recognise the hidden variables in the teaching and learning process, particularly at the post- 16 levels.

Less subject specific aims and objectives have always been a feature of primary and secondary education; making lesson content 'relevant' is a primary concern of primary school teachers, combining number skills with shopping activities and explaining abstract concepts with real objects. As students approach their pre university years, it could easily be argued, there is an increasing emphasis on content coverage and examination preparation.

The little pedagogical variation between syllabi that exists can be discounted, at least in the limited samples we have studied and hence the factors behind the differences in outcomes of each curriculum cohort must be found elsewhere. In this particular case, the focus has to move once again, towards the structure of the curricula and the overall possible effects of this; it is not teacher centred. Rather than being driven by the teacher, it is a feature of the curriculum which could explain student approaches to work, both in school, and then at university.

The study has already looked at brain research which suggests that we should look again at what and how we teach, linking into the above. The point to be pursued is that if the structure, aims, objectives of a curriculum invite and encourages the predominance of a particular teaching approaches / learning approaches then we should ask why, if the final 'product'/student of a particular education system is believed to be more highly regarded by institutions of Higher Education for possessing certain skills then, the onus falls back onto the curricula and the

teaching and learning within the two rival curricula, to examine the origins of this shortfall.

Time constraints, class size, pupil composition may all affect teacher approaches within classrooms. These have all been accounted for within the questionnaires sent out to schools. Time constraints are similar across the two curricula, with IB schools probably facing more time difficulties due to their shorter school year. Class sizes differ considerably, but there is limited correlation between teacher approaches and class size, and in any case, the discrepancies in class size apply to both curricula. Pupil composition is the most difficult to judge; if teachers within one system have to handle a higher proportion of special educational needs students, or have to cope with greater levels of pupil disruption, then this could explain differences in teaching methodologies. It was found to be extremely difficult to couch questions in order to judge on this issue. Questions were asked about whether the schools had open access policies and what proportion of the class were English as a Second Language speakers. It was evident that most International Baccalaureate schools have high proportions of ESL speakers and that open access policies predominate in both systems. Hence, if difficulties in receiving information were to be encountered it would appear to be most likely in the International Baccalaureate Diploma system. However, it remains a weakness of this part of the study; without a specific discipline questionnaire, then it remains difficult to judge the effect of this variable on the methods employed by teachers.

In both curricula it is indisputable that much of the teacher methodology stems from external influences. If this were not the case then we would have to assume that the Advanced Level teachers and the Diploma teachers are different personality types (this is one assumption we cannot afford to make without extensive psychometric testing). Brown and McIntyre (1993:32) conclude that teachers indulge in classroom practices which are familiar, comfortable and successful in achieving his or her purpose. The fact that schools are commonly recognised as conservative institutions would suggest that this generalisation has some sound basis. When you study the teacher interview responses later in the chapter and recognise that they believe that their work is being mainly judged on

examination results, then it is clear what Brown and McIntyre (1993) are referring to when they claim that teachers teach in the way(s) which most 'successfully achieve his or her purpose'. If the purpose is to gain the best examination results possible in a 'high stakes' examination environment, then this easily explains the results of the student surveys.



#### 4.4 Teacher/Student Interaction

The differences between the general approaches of the Advanced Level teachers and the International Baccalaureate Diploma teachers are not explained however. How exactly this relates to learning in the classroom is vital. If it can be shown that some types of teacher interaction predominate at a cost to others, then this could explain the strengths of certain groups of pupils in certain skill areas and the weaknesses in other skill areas. Flanders (1970) categorised teacher/ student interaction into:

- 1) Indirect influence- teacher accepts the feelings of the students, praises or encourages, accepts and uses their ideas, asks open- ended questions.*
- 2) Direct influence- teacher lectures and asks rhetorical or closed questions, gives directions or commands, justifies authority by issuing statements intended to change student behaviour, extreme self reference.*
- 3) Student talk- student responds in a predictable manner to teacher, student initiates a discussion (163).*

What researchers have attempted to do is to provide a framework of referencing for classroom observations and allow easy access to the multidimensional craft of teaching. There are many limitations of their usefulness in that social interaction is difficult to record accurately, but they allow us an insight into what 'balance' is achieved in classroom interaction. There is no definitive 'right' or 'wrong' way to teach, however lessons comprising a large amount of 'direct influence' (see '2' above) generally do not lead onto the types of learning mentioned by Bruner as being particularly productive.

Even if it is assumed that teacher methodology differs little in the one comparative subject of Economics, the effect on the learning of Advanced Level and International Baccalaureate Diploma students may still differ due to other factors, connected not with the environment of a specific subject, but with the cumulative effect of mandatory study across disciplines.

Through the work of many educational theorists student learning style theory has advanced rapidly, however the major contributor to this field has been Kolb (1976), working through the 1970's and the 1980's. His theories may be superseded in later years, however at this time his work is the basis for numerous research articles, appearing in hundreds of bibliographies on the subject of learning styles. His work will form the basis of further discussion on how learning takes place, why reliance on one style can be unproductive, and most importantly, how the theory can be shown to have an important bearing on the curriculum comparison study. Kolb's main assertion is that students develop different learning styles; using research derived from the work of Jung and Dewey, Kolb constructed a bi- polar model of learning styles. What he shows is an effective learning process, which is cyclical and involves

CONCRETE EXPERIENCE (CE)→REFLECTIVE OBSERVATION  
(RO)→ABSTRACT CONCEPTUALISATION (AC)→ACTIVE  
EXPERIMENTATION (AC).

In practical terms, Kolb recognised that students could use any four of these learning strategies, and that it was not necessary to start at the beginning. However, a reliance on a limited number is limiting and, as Haywood (1997:138) points out

*“Even if an individual's preferred style of working favours a particular stage, it is incumbent on that individual to incorporate the others at some point for effective learning to take place”.*

Hence if a learning cycle is established whereby the narrowness of a particular curriculum creates teachers who are limited in their approaches to Kolb's model and this is then passed onto students, could it not be argued that any limitations in the learning approaches of students attending university have some substantiation? If we look in detail at the cycle it can be recognised that the learning process and the teaching process are inextricably linked. If we break down the cycle, four types of learner are highlighted. In brief:

- 1) The 'concrete reflective'- this type must be able to see relevance in what they are studying
- 2) The 'abstract reflective'- this type would be able to respond to information presented in an orderly, logical fashion, and benefit if they have time to reflect on it.
- 3) The 'abstract active'- this type would respond to the opportunity to work actively on well-defined tasks and to learn by experimentation.
- 4) The 'concrete active'- this type would apply theory to real problems, and would appreciate the resources enabling self discovery

To set teaching and learning in context we must link theories on the workings of the human brain to methodology within the classroom. Whilst the research mentioned above indisputably places teacher methodology to the forefront of arguments regarding the relative effectiveness of learning differences, the topic is further clarified by relating to studies on how certain subjects involve specific means of teaching. The difference between Science teaching and teaching of literature for example, has been shown to encourage the development of specific learning styles within the student. Brody (1995:45) constructed an epistemological model that allows this study the means to develop a research stance on the varied significance of teaching/learning models.

| <i>Transmission</i>                                                                                         | <i>Transaction</i>                                                                                                                    | <i>Transformation</i>                                                                          |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <i>The nature of knowledge and knowing</i>                                                                  |                                                                                                                                       |                                                                                                |
| <i>Knowledge is transmitted from teacher or text to student. Knowledge is seen as static and objective.</i> | <i>Knowledge is gained through interaction between the learner and his/her environment. Knowledge is based on learner strategies.</i> | <i>Knowledge is dynamic changing and is constructed by the learner. Knowing is contextual.</i> |

### *Sense of authority*

| <i>Teacher centred.</i>                                                                                                  | <i>Student centred</i>                                                                                                             | <i>Community of learners</i>                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <i>Learner is dependent on the teacher, who is responsible for learning outcomes and design of learning environment.</i> | <i>Learners are responsible for their own learning. Teacher is not authoritarian and strong intrinsic motivation is empowered.</i> | <i>Visible authority does not Teacher uses interaction with the environment; complexity openness and creativity are emphasised</i> |

### *Conceptions of learning*

|                                                                                                                                                              |                                                                                                                                                                                     |                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Learning is transferring knowledge and skills from teacher to learner. Content is emphasised and learning is understood as a linear and simple action</i> | <i>Learning is empowered through co-operative activities, problem solving and higher order thinking. Interdependence and productive talk are essential in the learning process.</i> | <i>Learning is a change in the learner's experiences and values. Constructive, self regulative, and co-operative processes are emphasised. Learning is always seen to be ongoing.</i> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

When placed against the research findings of essential differences in the characteristics of graduate students from the two curricula, this model can be used as a basis for further study. In the first category, that of 'the nature of knowledge and knowing', varied research has highlighted that students limited to a particular field of study will invariably assume a concentration on that discipline to the exclusion of others. The fact that, the Advanced Level curriculum in particular normally limits the choice and range of subjects could be assumed to lead to a student who has mastery of the closed linear paradigms, recognised by Brody, with a view that their subject knowledge is static. This may occur because these students have no measure of movement, of flux. If it is not in the syllabus of a subject to discuss the nature of historical change, or the philosophical underpinning of subject direction, then it is left to the individual student to pursue these directions.

This leads onto the second of Brody's 'orientation' model themes, that of 'sense of authority'. The Science student in the Advanced Level may see the extrinsic reasons for the acquisition of scientific knowledge, and he or she may also possess the intrinsic motivation of Science learning. However if, in the teaching of Science, the teacher's authority has been the dominant theme, then it could be argued that this student would not know how to pursue acquisition of knowledge and understanding outside the required field of study. Brody's model highlights the limitations of the 'Transmission' orientation, where the teacher tests for content mastery and assumes academic subject success if a competent level of linear and simple learning is achieved.

As has been previously mentioned, the lack of previous study on the International Baccalaureate Diploma sets limitations on the application of Brody's model into each of the respective curricula. This signified that the study would necessarily have reached an impasse at this point; the 'hidden' curriculum on which the discussion centred at this stage could be construed in two very different ways:

- 1) Teacher/ student exchanges could have contrasted across the curricula (as in Brody's model), leading to very different teaching and learning experiences
- OR
- 2) The 'hidden' curriculum centred not around differences in classroom relationships in particular subjects, but around the learning experience dictated/engendered by the structure of the curriculum.

It can be argued that the ALIS and associated questionnaires had already discounted the former, however the explicit nature of the questionnaires could not effectively fulfil the function of a study of classroom relationships. The optimum method was felt to be interviews with teachers who had taught in both curricula, making direct reference to Brody's model. We can assume that certain teaching strategies wholly engender the use of the transmission model. In 'high stakes' examination models, the degree of teacher transmission, in didactic mode, is extremely high. This feature possibly assumes greater dominance, the more 'high stakes' the curriculum.

This was certainly borne out by the interviews with teaching personnel who had taught in both Advanced Level and International Baccalaureate Diploma. However neither of the curricula were seen as more 'high stakes' than the other and teaching methodology was certainly not changed because of examination influences. The people ideally placed to comment on the two systems are the teachers who have worked in both systems. Their experiences of teaching within each system and the development of students are essential to our own understanding of whether the end product of each system is different in any respect and, more importantly, how any differences can be explained.

Advanced Level research has resulted in a finding that Advanced Level teaching is extremely didactic and the learning experience of students is accordingly limited. Many reasons have been put forward for this. The main argument is that of the limiting time factor, whereby the 'high stakes' examination structure of three full Advanced Level subjects place much more pressure on the teacher and the student to cover the syllabus than other, varied content or teaching and learning strategies are sacrificed. The second theory is that the content and structure for Advanced Levels is seen as a comprehensive preparation for university study and there is no need to change the content and thus force teachers to change their pedagogic practices from the curriculum base. Accordingly, it is argued that Advanced Level students suffer from a lack of variety and challenge within their curriculum and a refusal to change the curriculum does nothing to change this situation. For example a call by Graham and Tytler (1993:126) to integrate 'core skills' into the Advanced Level curriculum was refused on the grounds that "*all A Levels already embodied the necessary skills*". Attempts at change initiated a claim that dilution of the curriculum was "*meddling*" (126).

Nevertheless, it is evident from central government reports over the past decade or so that fears about the quality of the learning experience of the Advanced Level student remain. In the Higginson Report (1988a, section 2.4), the author writes: "*Advanced Level examining gives students too much credit for memorising facts and arguments, and too little for their capacity to think on their feet, to reason and exercise true judgement*".

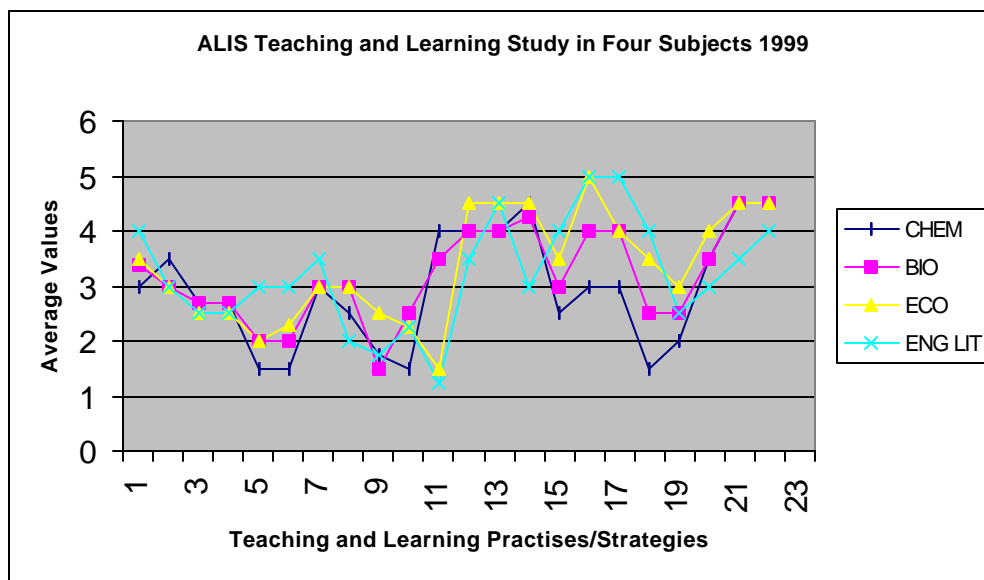
Macfarlane (1993:34) generally recognises the fact that teachers probably realise the negative side to this learning process when he concludes that even when teachers appreciate the benefits of sometimes tempering didactic methods, they are prevented from acting accordingly by over crowded syllabi. How much of this is caused by an examination structure, which measures success in a limited number of subjects, preventing a little more 'risk taking' in methodology, remains to be studied. It may even be that the didactic nature of the teaching process has no longer-term ramifications on university performance and desirable student attributes. Concentrated studies in depth are well received by certain disciplines in universities and it could be that the teaching embodied within the Advanced Level curriculum provide a natural underpinning of university study.

The fact that the mode of transmission also depends on the subject area is vital to the study. If we assume that individual subject methodology differs very little, as highlighted by the Economics studies, then student exposure to a wider variety of teaching and learning styles may very well be a prime variable in differences in approach to Higher Education.

In a large scale study on the teaching and learning styles of Advanced level students and teachers, one conclusion by Fitz- Gibbon and Wright (1995:7) was: *"How you teach depends on what you teach"* .

Research showed that the Sciences had a dominance of teachers presenting information/materials, which the students take down as notes. In the Humanities, on the other hand, there was a preponderance of talk and discussion, with fewer teacher directed activities. If we assume that the differences in teaching methodologies are negligible when comparing Economics, it may be appropriate to take the ALIS database and compare teacher methodology over the subject range. This comparison is only available with Advanced level, but if we assume that the Economics curricula comparison teaching methodological study is not unique, then we can assume that teaching across the disciplines shares common features.

Figure 4.2 Comparisons of Teaching and Learning Strategies (Reproduced from ALIS 2000)



- |                                                                                                                                      |                                                                                                  |                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| 1) Producing original work- an attempt to see what proportion of lesson time was spent in                                            | 5) Listening to another student presenting work- a learning strategy with practical applications | 16) Having class discussions led by teacher             |
| 2) Receiving individual work from the teacher- what proportion of teaching time is taken up in this activity                         | 6) Presenting work to the class                                                                  | 17) Reading                                             |
| 3) Receiving help from another student- one of the major ways of retaining information is to teach someone else that idea or concept | 7) Working in pairs                                                                              | 18) Preparing essays or reports                         |
| 4) Giving help to another student                                                                                                    | 8) Researching a topic                                                                           | 19) Working from previous exams (under exam conditions) |
|                                                                                                                                      | 9) Making use of IT                                                                              | 20) Working from previous exams (with help)             |
|                                                                                                                                      | 10) Using audio or visual materials                                                              | 21) Working through examples                            |
|                                                                                                                                      | 11) Doing practical work                                                                         | 22) Having a topic presented by the teacher             |
|                                                                                                                                      | 12) Using duplicated notes                                                                       |                                                         |
|                                                                                                                                      | 13) Making own notes from lesson                                                                 |                                                         |
|                                                                                                                                      | 14) Having notes dictated                                                                        |                                                         |
|                                                                                                                                      | 15) Having discussions in groups                                                                 |                                                         |

(ALIS 2000)



## 5. Summary

The predominance of subject specific teaching strategies conceivably leaves gaps in the acquisition of learning strategies for Advanced Level students. Whereas the International Baccalaureate students are forced by the structure of the curriculum to cover the spectrum of subjects (Humanity, Language, Mathematics, Sciences), the Advanced Level students are able to concentrate on areas of strength, very often limited to one discipline. The International Baccalaureate student also has the Theory of Knowledge course to support understanding of the interdisciplinary nature of learning and discovery.

The pertinent point in this discussion is that, in work by Kolb (1976:32) research showed that:

*“There is a strong similarity between the student's learning style and that of the teacher who influenced him” .*

If student's learning styles are determined by their teachers, then it may help to explain the university's preference for the learning styles of International Baccalaureate students and the perceived differences in the approaches of graduate students from the two curricula. The International Baccalaureate Diploma students are necessarily exposed to a variety of teachers, due to the requirements of the Diploma. It is almost beyond dispute, based on the educational research carried out, that our knowledge structure should be ideally based on the whole, with all parts interconnected. More importantly however, the way in which we conceptualise through language provides a major building block in intellectual development. Many educational psychologists have termed this ‘propositional knowledge’: the way individuals form concepts and interconnect them into conceptual systems.

This is important in the context of this study because it is the propositional knowledge, which complements procedural knowledge, the latter being the historical leader in modern schooling in a subject specific sense. The Theory of Knowledge course however, attempts to heighten the complementary relationship between the two forms of knowledge; to establish recognition that the links

between subjects are more useful and stronger than is usually considered. The English Department of Education and Science (1975) noted that many intellectual skills are thought to be generalizable across different subjects and using language to generate knowledge and conceptual understanding is not only the province of the language department.

Advanced Level students may be exposed to only one or two disciplines. As the figures quoted earlier show, only 40% of students experience Science/ Mathematics and Arts/ Social Studies at the same time. This has major importance on the discussion of the relative preparedness of the two sets of students for higher education. If the obvious outcome of research is that exposure to a wider range of subjects, to a wider mix of teachers, can affect learning styles, then we must assess the implications of this and how it relates to the question of Higher Education effectiveness. That the students do experience an extremely wide range of teaching and learning styles, if their subject choices transcend the faculty boundaries, is unquestioned.

It seems clear that the vast majority of subject teachers teach in a way dictated by the subject. Whether they do this because of the needs of the student, or because they themselves were taught likewise needs further study. There is little definitive evidence that specific subject teaching styles impact on the student in any way. However, if the dominant learner strategies evolve through interaction with the teacher, then the subject mix within the curriculum assumes great importance. In the Institute of Welsh Affairs' study 'Beyond the Border' (2000) the London School of Economics commented:

*The IB curriculum is more appropriate for LSE examinations with its emphasis on completing 6 subjects at the same time and its stress on producing scientists who can communicate and arts students who have maths and Sciences skills (21).*

Skills are not learning strategies, but certainly implicit in this quote is the notion that faculties teach in ways which limit certain aspects of the learning process. If the limitations such as communication skills are so obvious to an institution like

the London School of Economics, then the less obvious processes in learning may be discussed with reference to the two curricula.

The combination of classroom teaching methodologies and a natural propensity towards a limited number of subjects would seem to imply that students will necessarily benefit from a more varied teaching pedagogy. The stimulation factor has already been discussed, however the link between learning style and subject choice is an important one. It may well be that students succeed in some areas of the curriculum because the teaching in that area fits their preferred learning style, or it may be that their learning style evolves to fit the demands of that subject and that subject's teacher. Whatever the pattern of cause and effect, certain assumptions do emerge:

- 1) Teacher methodology is linked to subject taught
- 2) Teacher methodology makes little allowance for different learning styles and may even be unaware of the enrichment possible by encouraging other learning styles
- 3) Adoption of other, more 'unusual' learning styles within certain subjects can aid the students' approaches
- 4) The adoption of other learning styles can be taught explicitly or they can be assimilated by being exposed to a variety of teachers, who implicitly inform the student

The work on teacher and student approaches emphasises that as the teenager develops, he or she develops learning traits, much in line with the dominant influences in his or her life. These traits seem to be strongly linked to personal profile and teacher didactics, but they are not immutable or exclusive in any way. The majority view is that the learning cycle is influenced by teaching styles, but also that individuals are able to 'select' aspects of learning that best suit the learning circumstances, if their self-perception levels are sufficiently mature to be able to make that judgement. There are six commonly accepted facets of a mature understanding; explanation, interpretation, perspective, application, empathy and self-awareness. It can be argued that schools and the assorted syllabi seek to promote the initial three facets of understanding, yet face limitations with the three latter ones. When studying any coursework requirements, the common use

of analysis, evaluation and suchlike as course objectives or outcomes highlights the common goals of many, or perhaps it can be argued, most syllabi. 'Application' is also used, but this is one facet of understanding on which schools face difficulties, imposed on them by external circumstances. As most schools have teaching content imposed on them by external bodies, the need to cover content is a primary aim and the opportunities to apply that content are subject to severe time restraints under most systems. As can be seen in the study on teacher methodology, the fact that six subjects are studied at International Baccalaureate level may even give the teacher a feeling that their subject is not as 'high stakes' that there is more time to apply a little of what they know, though we have little evidence for this in pure didactical terms.

The final two facets of understanding are perhaps the most difficult to define and yet, possibly, the most vital. In the various 'intelligences' which Howard Gardner (1991) and his colleagues cover, the majority would be termed as subject specific by the educational community, except for two. The assertion by Gardner is that 'intra- personal' and 'inter- personal intelligences' help us to approach life and the roles we play.

If such 'intelligences' are linked to the discussion of what makes up understanding, then we must analyse the final two facets and incorporate them into curricula workings. For example, empathy is encouraged in some disciplines and is even entered as a course objective. Empathic awareness however, is very difficult to cultivate if there is little recognition or learning about other disciplines. The scientist who deals primarily in the Sciences in depth cannot have the empathic understanding of his colleagues and their concerns in the Arts. Even in this narrow context, there is so obviously a need for a wider coverage of the curriculum, which brings in other aspects of the world and its different cultures and problems. Ducret (2001) comments:

*The new economy demands that young people leave school with strong abilities to read, write, calculate and apply disciplined thought to the solution of problems. Citizenship in every society requires an understanding of the history, government and tradition of not only that society but of many others as well (5).*

Whilst not directly advocating a broader curriculum, the principle of study across disciplines and national boundaries is inherent in his statement.

The final facet of understanding is one that the International Baccalaureate Organisation have held up as one of their main aims since the advent of the Diploma programme in the early 1970's. "Learning how to learn" is an attempt at promoting self-awareness. If a student can recognise the personal learning styles, prejudices, habits and suchlike, which impede one's own understanding, then the source of overall understanding lies internally, not externally. The Theory of Knowledge programme at the International Baccalaureate Diploma level is aimed at developing this facet of understanding. It is an interdisciplinary requirement intended to stimulate critical reflection on knowledge and experience gained inside and outside the classroom. The course aims to challenge students to question the bases of knowledge, to be aware of subjective and ideological biases and to develop the ability to analyse evidence. The IBO (2000:21) subject information claims Theory of Knowledge encourages students to:

*“Examine the grounds for the moral, political and aesthetic judgements that individuals must make in their daily lives”.*

There is a common misconception that one either understands a concept or one does not; that there is always a magic moment when the idea becomes crystal clear. This problem is inextricably linked with the whole idea of understanding, culminating in the final facet of understanding, self-awareness. A syllabus can concentrate on all five of the facets of understanding, but the one that ultimately determines the grasp of concepts and ideas is self-awareness. To understand the world we must be able to understand ourselves; through self-awareness we understand that what we understand, or do not understand, is ultimately connected to our own beliefs, fears, expectations.

The capacity to continually self assess is essential to understanding; if a Maths concept is poorly received, could it be the case that we have an in-built sense of defeat where this subject is concerned? What strategies can we use to get around this problem? Meta-cognition transcends difficulties with particular parts of a

syllabus. It should be able to highlight our preferred methods of understanding across the whole spectrum of education, including why we feel as we do about Mathematics. When we study the Theory of Knowledge, it is significant that qualitative evidence points to many meta-cognitive advantages, stemming from its study.

Edinburgh University in the IWA publication *Beyond the Border* (2000) was quoted:

*The university has long experience of the International Baccalaureate and welcomed it as an entry qualification. We commend the Theory of Knowledge course as being of immense value to students generally-not only for the brightest. Students arriving at university with extended essay and TOK experience responded so much more confidently to tutorial sessions (12).*

In the same study, Homerton College, Cambridge (2000):

*International Baccalaureate students have the edge at interview. Their ability to cross reference literature and philosophy and to be at ease doing so is a feature attributed to insights gained in the Theory of Knowledge course (17).*

The University also recognised the difference in the International Baccalaureate Theory of Knowledge students (2000)

*At the University of Birmingham we recognise the quality of the International Baccalaureate students and its suitability as an entry qualification. We know that the IB produces well- rounded students through its academic content and CAS and we particularly welcome the encouragement of critical thinking through the Theory of Knowledge component (44).*

To prove high levels of self-awareness stemming from the teaching of Theory of Knowledge at the Diploma level is not really possible without an expensive array of psychometric testing materials. It would appear however that the International Baccalaureate Diploma graduates seem to possess the ability, at least as far as the admissions officers are concerned, to settle easily into university life and its study challenges. Most pertinent of all is the difference in how the students were perceived as 'willing to take intellectual risks'. The questionnaire sent to university admissions officers showed a marked willingness on the parts of the International Baccalaureate students to offer up solutions or opinions, which may or may not have been correct. This brings in another aspect of the study, namely the source of the self- confidence which makes this possible.

Numerous studies have attempted to offer up reasons why the ability and the desire to learn vary from system to system. Modell (1994:3) concluded that:  
*“To understand why children learn more at school (in some systems) we must understand why children desire to learn.”*

What was needed was to understand what it is about the content of school learning that students value. This could be claimed to tie in closely with research on the effect of anxiety on the attitudes of students towards their own schooling, for Modell recognised that high levels of self evaluation and the ability to 'step back' from within the school system were essential ingredients. Also, students were seen to require a reason to study. This theme of 'relevance' has been repeated throughout this study; 'relevance' arises from the ability to see the practical usage of subject specific skills within a curriculum. Explicit 'relevance' with regard to Higher Education plans is one way to motivate, but as the section on anxiety highlights, this can directly affect other aspects of a student's education viz. a viz risk taking and suchlike. Hardman (1997:123) summarised the necessity of 'safe' study, from the viewpoint of a 16 year old Advanced Level student:

*(Students) take examinations which are high in the rewards they carry as passports to prestigious universities, degree programmes and 'middle class' employment, achieved through such specialised academic study .*

If Advanced Levels are seen as ‘tokens’ to Higher Education, then it is certain that the Diploma is perceived likewise. However, the International Baccalaureate Diploma student does not have the same freedom of subject choice as his or her Advanced Level counterpart and yet, paradoxically, ‘relevance’ in their learning experience is recognisable in the relationships across subjects, from their weakest to their strongest, from their favourites to their dislikes. Extrinsic motivation factors are less vital because students are able to see outside the subject specific domains. In the next chapter, responses by International Baccalaureate students highlight the consensus that flexibility of choice is a strength and that higher subject load leads to a broader overview of the world.

The time allocated to teaching subjects within each of the curricula would seem to point to better preparation for university study in the UK, which is itself aiming at subject specialisation. The practical argument would be that the longer the time spent with the subject at 16-18, the better the university preparation. However, once again, this does not stand up when subjected to scrutiny- university results point to higher achievement levels amongst International Baccalaureate students, despite them spending up to one-third less contact time on specific subjects. Once again, an indefinable variable enters the discussion, namely that it is only possible to infer the source of effective learning practices.

Summarising Le Doux (1996) and Hart (1999), new experiences physically change the brain by causing neurons to sprout new branches, thus increasing communication across minute gaps called synapses. This electrical impulse’s ‘leap’ is the physical basis of learning and memory. In practical terms, this can be optimised in educational environments in various ways. The main means of stimulating learning is through enhancing personal meaning to as many students as possible. This can be achieved through various teaching strategies connected to a variety of learning experiences, and more specifically, to a wider ‘net’ of sensory input. Whilst not ensuring that the need for personal meaning is found in every student, a wider variety of subject matter and teaching styles must increase the opportunities of this occurring.



Looking at curriculum from the perspective of brain cell research, pragmatic teaching approaches should be based around overarching concepts that help students in their search for natural meaning. This cross curricular approach serves elementary and middle school systems well, however is rarely used in the senior years of high school. Subject specific teaching styles and curriculum structure remain dominant, and whilst the International Baccalaureate Diploma does not constitute a radical model of cross curricular practices, it does go some way along the route of widening the educational experience, making that experience more 'relevant' to its users. Brain cell research strengthens the case for a more radical curriculum structure than is offered by either curriculum at the present time.

The theoretical approach also requires the application of personal data from an ethnological perspective in order to further strengthen the conclusions which may arise. This chapter is no exception. The tentative finding that the learning process varies with curriculum structure is difficult to dispute, but it is through the input of individuals who have experience of both curricula that further strands can be extracted from the complex teaching/learning discussion. The following chapter concentrates on case study analysis of teachers, a student and a particular school, with the aim of establishing different points of view on the comparative research and helping to filter out the complexities of the original problem statement.

### STUDENT AND TEACHER PERCEPTIONS

#### 5.1 Introduction

The International Baccalaureate has always maintained that it attempts to stimulate skills of critical thinking within its curriculum through encouraging the development of a global perspective. It has explicitly stated that students must have a global overview and understanding; implicitly developing the art of identifying and reversing bias, prejudice and one-sidedness of thought and the art of self directed, in depth, rational thinking. These are the qualities of meta-cognitive thought and a major omission from the Advanced Level curriculum.

There is no method of measuring such an abstract concept empirically, but the inductive method can be used to investigate further the value of this particular process. Research by Wang and Lidvall (1984) showed that self-monitoring and self-regulatory activities not only contribute to improved acquisition of subject content, but also to improved generalisations and transfer of knowledge and skills. The University admissions and teaching personnel recognised many qualities in the International Baccalaureate Diploma students, not least their levels of "self discipline" and "global awareness". If self-regulatory activities are a feature of teaching in the classroom, this study has not been able to find them; the major finding is that in terms of explicit teaching strategies, there is negligible difference between the two curricula.

However, the fact that International Baccalaureate diploma students must take a Science for example means that certain aspects of their education are reinforced. Brown, Bransford, Ferrara and Campione (1983:11) included factors such as planning, predicting outcomes and scheduling time and resources as necessary pre- requisites of the development of meta cognitive attitudes. In a curriculum which requires the study of six subjects, plus Theory of Knowledge, plus the

writing of an extended essay and the requirement for Creativity, Action and Service (CAS), the need for planning takes on prime importance.

This is not to argue that teachers in International Baccalaureate schools differ markedly in their approach to their teaching objectives. Schools can always be argued to be conservative institutions, uncritically teaching in subject specific ways. The difference, it can be argued, between the International Baccalaureate Diploma and the Advanced Level students comes not from above, but from within. The demands of the curriculum mean that the planning and synthesis mentioned, together with the global awareness component, are contributors to a meta-cognitive difference of being more able to enter sympathetically with the thinking of others, and dealing rationally with conflicting points of view. The scientists have to study literature, the Humanities students must prepare hypothesis; all must study Theory of Knowledge, a subject which invites reflection and the necessity of explaining the basis for their own beliefs.

Paul (1990: 17) suggested that students are naturally inclined to seek an easy path to learning; he emphasised that normally students do not naturally think critically or engage in reflective thinking. They have to be encouraged to do this, in his particular case he argued that teachers were the natural stimuli for this. Critical theory involves how people learn, with teachers encouraging the student in the pursuit of truth and equity. This has never been a pre-requisite for an International Baccalaureate teacher as far as the study has discovered, but as has been mentioned, it could be said that it is a model originating from the curriculum structure. Thomas (1988:10) reflects this:

*Above all, the education provided in the International Baccalaureate programme involves a commitment to internationalism, a realisation that understanding, tolerance, truth, justice, co-existence, and solidarity are ingredients without which our world cannot survive .*

Paul (1990: 76) stated that the necessary pre-requisites for genuine meta-cognition were 'intellectual humility, courage, integrity, perseverance and faith in reason'. He was not referring to any particular curricula. There are a variety of

ways to stimulate critical thinking skills, but they all share one common feature, namely to make the learner a skilful user of knowledge. When the study considered the opinions of Higher Education administrators in an open questionnaire, this theme was dominant. As the world moves into an era of information overload, the purpose of education will be to train people to learn how to use knowledge, not to impart knowledge. For educationalists, trained specialists in their subject areas, this will undoubtedly cause problems. There is nothing to suggest that this is different in teachers of either curricula, however we do arrive back at the same point, the International Baccalaureate Diploma's 'hidden curriculum', not enhanced by the didactics of the subject specific classroom, but by the structure of the subject choices.

By referring back to the questionnaires (ratings) sent to teaching and admissions staff, we can recognise that there are certain attitudinal fields, which appear to 'lift' the International Baccalaureate students above their Advanced Level counterparts. Global awareness is an understandable factor in this process. However the willingness to take intellectual 'risks' and capacity to argue abstract logic are areas where the basis for the ratings differential is less clear. If there was a way to link the study of the International Baccalaureate Diploma directly to such areas of study, then the investigation would have a much firmer base on which to carry itself forward. With the resources available, we can deduce a correlation between the higher comparative diploma attainment and the findings of the admissions study, but without some forms of pre testing and post-testing on measures of critical awareness there remains a limitation to a clear conclusion.

What cannot be seen from such a study is the way in which other variables impact on the teaching and learning. Obviously individual case study comparisons of learner perceptions are difficult; very few instances of students experiencing both curricula do occur. In the course of the study, one such learner was found and attempts were made to make transparent connections between teaching and learning within the contrasting curricula.

The research utilises qualitative data and has made use of the 'grounded theory'  
The research utilises qualitative data and has made use of the 'grounded theory'

methodology first described by Glaser and Strauss (1968): to allow the data, as far as possible, to define the development of the case study research and to use the issues which emerge as a basis for further investigation, whether that be ongoing qualitative along the same lines, or to triangulate other methodologies within the context of the study. The interviews with the subject were informal and questions were open ended and designed not to 'lead'. The exception to this 'open endedness' was the biographical section.

## 5.2 Students

Ruyam Mahmood was seventeen years old at the time of the interviews, a Pakistani female whose family had been transferred from Bradford, UK to Lisbon in Portugal. Ruyam's father had been the Pakistani consul in Bradford and was moved by the diplomatic corps to a similar position in Lisbon. This created many problems for Ruyam's education, as she was one year into a two year Advanced Level course when the transfer instructions were given. The family were advised to try to keep her in the UK but decided to contact schools in the Lisbon area, one of which included St Dominic's International School. Advanced Level opportunities do not exist in Lisbon and hence it was decided that Ruyam would attend International Baccalaureate Diploma classes for the remaining year of her secondary education. This provided a unique opportunity to interview a student who had experienced both curricula.

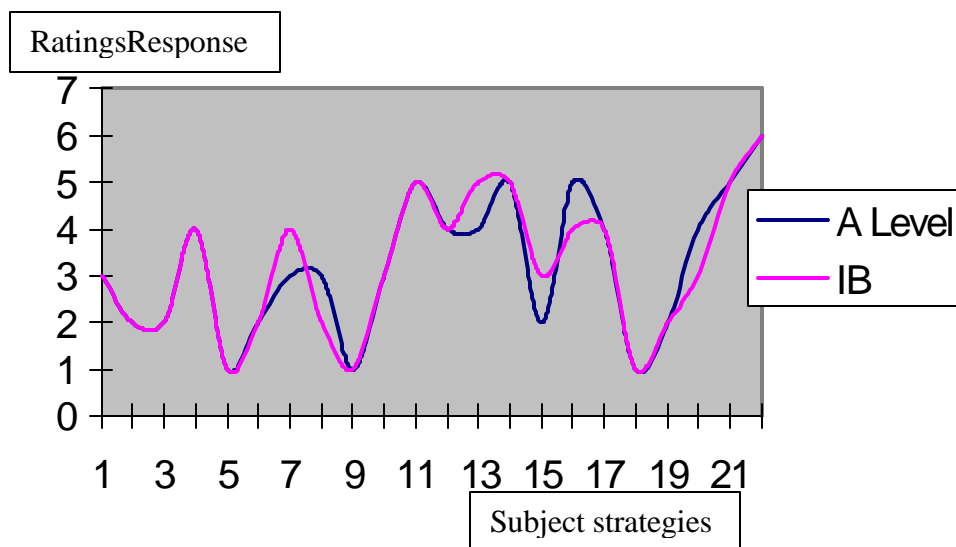
In academic terms, Ruyam was a high achiever; she had already passed Urdu and Psychology at AS level, with two A level grades and was now pursuing Biology, Mathematics and Chemistry in order to fulfil an ambition of entering medical school. In the initial interviews she came across as objective and adaptable so the change in school and family life was judged to have had a minimal effect on her perceptions. One of the concepts intrinsic to the interview data is that concerned with how young adults such as Ruyam make sense of her situation and are able to understand their progression and the progress of others.

Bourdieu (1976) and Hodgkinson (1996) both point to the ways in which understanding of the learning process is able to be assessed longitudinally by individuals because the very act of learning itself enhances the ability to judge progress; the further along the learning curve we progress, the more we understand our own progression. Nixon et al (1996: 49) emphasises the point that learning lies at the root of identity and agency:

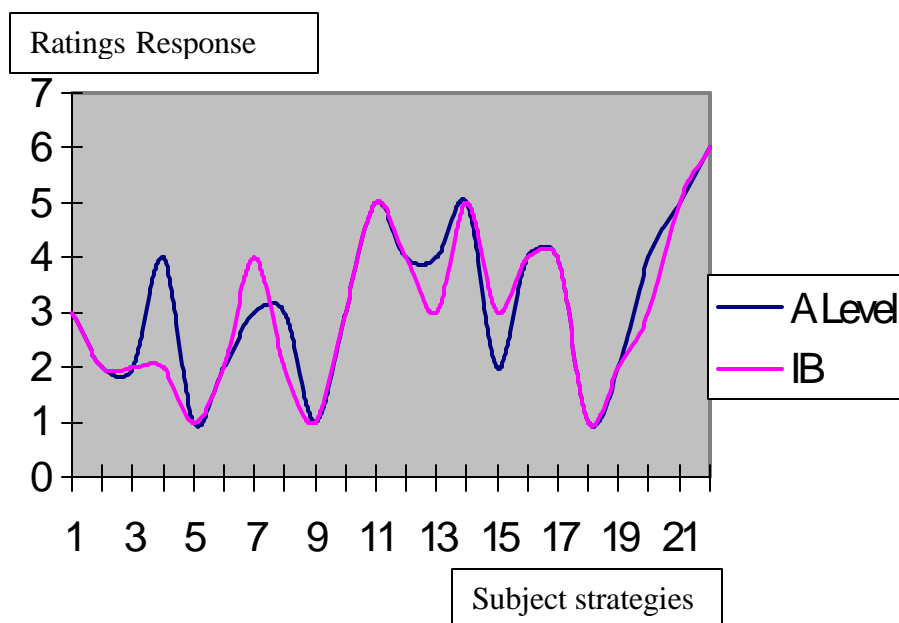
*"It (learning) is an unfolding through which we learn not only what makes us unique-what individuates us-but how we can make that distinctive agency work in the world".*

In the case of Ruyam, the study concentrated on the two major areas of teaching and learning. The questionnaires given to Ruyam were identical to those given to the Economics students and covered the teacher methodologies employed in the respective curricula. The main limitation was that Ruyam had experienced the IB structure for only five months at the time of the interview, yet she had had a full year taking Advanced Levels.

*Table 5.1 Teaching and Learning in Chemistry*



*Table 5.2 Teaching and Learning in Biology*



### **Key to 'x' Axes**

- 1)Producing original work- an attempt to see what proportion of lesson time was spent in self study and in creating work*
- 2)Receiving individual work from the teacher- what proportion of teaching time is taken up in this activity*
- 3)Receiving help from another student- one of the major ways of retaining information is to teach someone else that idea or concept*
- 4)Giving help to another student- a strategy which can help socialising and other*
- 5)Listening to another student presenting work- a learning strategy with practical applications*
- 6)Presenting work to the class*
- 7)Working in pairs*
- 8)Researching a topic*
- 9)Making use of IT*
- 10)Using audio or visual materials*
- 11)Doing practical work*
- 12)Using duplicated notes*
- 13)Making own notes from lesson*
- 14)Having notes dictated*
- 15)Having discussions in groups*
- 16)Having class discussions led by teacher*
- 17)Reading*
- 18)Preparing essays or reports*
- 19)Working from previous exams (under exam conditions)*
- 20)Working from previous exams (with help)*
- 21)Working through examples*
- 22)Having a topic presented by the teacher*

To avoid any cross duplication of response, the questionnaires were given one week apart, starting with the Advanced Level, followed by the interview one week later. The responses are detailed in tables above. Ruyam's third repeated subject, Mathematics, was taught by an outside tutor and thus was not made available for comparison. Both her Chemistry and Biology show close teaching relationships between curricula. The slight variations in responses are shown to be unique to a particular classroom situation and are unimportant to the aims of the study. For example, the variation in Biology –giving help to another student (number 4) can be attributed to the dynamics of the class, bearing in mind the overall similarities.

When questioned further, Ruyam's main perceived differences in curricula approach centred around the Theory of Knowledge course and she specified this course as the essential differences between curricula. All Diploma students must study Theory of Knowledge, a subject studying the philosophy of learning. Julian Baggini (Times Educational Supplement 2000:16) states:



*“Many philosophers have been arguing that ...their subject is the supreme teacher of transferable thinking skills.”*

The Theory of Knowledge course has frequently been represented as a key element in the educational philosophy of The International Baccalaureate, the 'cement' that holds the other parts together, a point of fusion and reflection. The programme is intended to help the students recognise themselves as knowers. This could be the major difference that Ruyam was referring to. According to Alec Peterson (1987) commenting on standard school programmes:

*Students don't understand the relationship between subjects in schools, why different ways of knowing affect what it is that is known. Students do not understand the past as historical truth, or scientific truth or mathematical truth or moral truth (21).*

Whether cross-transferable skills are developed through a course such as the Theory of Knowledge is difficult to quantify. Certainly this particular student did register its significance. Research suggests that explicit thinking skills are invaluable to the teenage student and it is the structures which make the learning of such skills meaningful and which contribute to the students' overall grasp of transferable skills techniques.

According to a research paper published by the English department for Education (DFE, 1999, Research Report no 115) objectives include:

- *Developing thinking skills supported by theories of cognition which see learners as creators of their own knowledge and frameworks of interpretation. Learning is about searching out meaning and imposing structures*
- *There is a need to be explicit about thinking..they (the students) must be taught explicitly how to do it*
- *Several taxonomies of thinking are available. Some approaches identify multiple intelligences for enhancement- linguistic, logical, mathematical, musical, kinaesthetic (34).*

Whatever viewpoints are held by teachers regarding the most effective teaching and learning practices within the subjects studied after 16; a time of rapid intellectual awakening, they themselves must always view learning from a subject specific viewpoint, if only because they will themselves be judged in their effectiveness by subject results. Interestingly, the brain research mentioned in the study's introduction stresses the importance of 'relevance' in any longer term learning strategies. The social constructivist view of learning supports this as it indicates that our most important learning does not take place through the addition of discrete facts to an existing store but by relating new information, new experiences, new ways of understanding to an existing understanding of the matter in hand.

The study does not however recognise is the benefit of cross-curricular study and the connections made between subjects, perhaps because this opportunity is limited within the Advanced Level curriculum. Edwards (1997: 14) states that:

*“Breadth or balance may be desirable, but neither is required. Nor are tangible benefits in the assessment of students' performance attached to their capacity to make cross-curricular links” .*

Ruyam also recognised the cross curricular shortfall in her Advanced Level experience:

*“I would have preferred to take Urdu and Psychology for the two years, but the time requirements made this impossible.”*

It is significant that the British government is studying an area of the curriculum which is similar to what the IB model calls Theory of Knowledge. A Nuffield Foundation report in The Times Educational Supplement (1999:13) confirmed that two major stands of effective learning were (direct quote):

- *Talking about learning with pupils so that they develop a more 'professional' language for discussing learning*
- *Explaining aspects of learning that we, as adults take for granted but which pupils may not always fully understand.*

The growing importance of generic, transferable skills challenges curricula to prepare students for a more fluid and uncertain organisational environment-skills

such as information management, self-evaluation, managing risk and learning how to learn. This study does not suggest that such developments arise only from the teaching of a subject such as Theory of Knowledge, but it does implicitly register that the Advanced Level curriculum has no effective replacement. As studies with university personnel will show, the consensus is for such change, but the impetus is lacking.

The focus remains, not on structure and content but on levels of attainment. The prevalence of examinations has led to many calls for the British government to reassess its priorities. What seems to be needed is a clear understanding that the world of work and Higher Education are asking for things which the present 16-18 system cannot accommodate. No strategy has offered; Advanced Levels remain a means of imparting information, rather than developing the individual. Her Majesty's Inspectorate (HMI) have recognised that the curriculum which practises memory skills at the expense of developing applied skills is failing the students who are to enter the new world, where information flows by at a more rapid rate than ever before. As Brunner (200: 138/139) highlights:

*“The teacher’s spoken word and the written one are no longer the sole medium for the delivery of education. How can the traditional function of schools not change?”* .

The interview with Ruyam registered few perceived differences between the curricula, supported by her methodological questionnaire. On the individual subjects, she stated:

*“Chemistry has the same practical components and is taught in a very similar way to Bradford”*.

*“Biology has a few differences in what I am expected to know, particularly in physiology, but the practical requirements and the teaching is almost identical”*.

If the Advanced Level can be shown to have such similar subject content and aims and objectives, together with teacher didactics, then the significance Ruyam gives to the Theory of Knowledge course in particular, deserves further consideration. To expect her to have commented directly on the Advanced Level’s approach to critical thinking would have been ambitious. However, Ruyam did say :

*“The only subject which gets you to think about other subjects is Theory of Knowledge”.*

Skills such as developing competence in thinking and reflection, in evaluation and application of critical judgement, in making connections between subject matters which contribute to a greater overall understanding of how the world works, were not raised by the student. It was felt that to raise them in closed questions would have been unproductive and probably a case of ‘feeding’ the subject.

The variables involved in such a study as this must necessarily create some opportunity for doubt regarding the reliability of the summaries, and there can be no definitive evidence offered as to how much the Theory of Knowledge course does contribute to student learning approaches.

The aims and objectives of the course are grounded in cross-disciplinary study, starting with the aim that students:

*Develop an understanding of why critically examining knowledge claims is important.....To develop a concern for rigour in formulating knowledge claims, and intellectual honesty(IBO 1999: 5).*

The specific objectives highlight the way in which the course attempts to supply the means to make curricular connections and stresses the importance of a wider study perspective in formulating hypothesis or solutions. They are expressed in a retrospective way as: students should be able to:

- *Demonstrate an understanding of the strengths and limitations of the various ways of knowing and of the methods used in the different areas of knowledge*
- *Demonstrate a capacity to reason critically*
- *Make connections between and across Ways of Knowing and Ways of Knowledge*
- *Make connections between personal experience and different Ways of Knowing and Areas of Knowledge*
- *Demonstrate an understanding of knowledge at work in the world*

- *Identify values underlying judgements and knowledge claims pertinent to local and global issues*
- *Demonstrate an understanding that personal views, judgements and beliefs may influence their own knowledge claims and those of others*
- *Use oral and written language to formulate and communicate ideas clearly (IBO 1999: 5)*

The objectives highlight the wide ranging yet in-depth approach to knowledge acquisition, and also to the important questions surrounding the basis of knowledge and beliefs. The reflection is wider than mere subject examination and the framework is put in place for an evaluation of the whole range of faculty areas. Again, a point is reached whereby qualitative research has offered a vital comparative insight, but a much wider pre-test, post-test study is now required, beyond the scope of this investigation.

### 5.3 Teacher Perceptions

The purpose of the questionnaires has been essentially a process of data collection; the original research objectives have been partially met with regard to a form of statistical foundation laying. The questionnaires served a major purpose in that they aided in forming generalisations to support the original hypothesis, but interviews were difficult due to the travel and time necessary. As the Diploma is a world-wide qualification, access to a larger sample of respondents was not available and hence standardised interviews were dropped from the original research agenda and replaced with the postal questionnaires. However, the need for interviews was still recognised.

Here, the objective was to attempt something no other area of the study, except the student interview with Ruyam, could do- namely, ask teachers to compare their experiences of the two curricula. The question of who to interview was problematic; exact representativeness was unnecessary, but we did need teachers with recent experience of teaching in both curricula were needed and they had to be within interviewing distance. The number of teachers was also a problem; time constraints on the interviewer and the respondent presented practical dilemmas. It was decided to interview three teachers, representing different parts of the subject spectrum: Physics, Drama/History and Mathematics. The teachers were local and time constraints were less of a problem, although they still existed.

Andrew (History and Drama) is Australian, with 25 years in teaching and experience of 3 types of post 16 curricula, including Advanced Level and International Baccalaureate Diploma (5 years and 3 years respectively). Ray (Mathematics) is British, with 20 years in teaching and experience of the two curricula (14 years in Advanced Level and 6 years in International Baccalaureate Diploma). James (Physics) is British/Spanish, with 18 years in teaching and experience of the two curricula (14 years in Advanced Level and 4 years in International Baccalaureate Diploma). The addition of a female would have been preferable for better balance, however there were none who fitted the desired profile.

The purpose of the depth interview was to collect the opinions of trained professionals about the pedagogic practices associated with their subjects and to improve the conceptualisation of the research problem. This was the first opportunity to directly compare the two curricula. Previous study had attempted to avoid bias and emotive response by not implying any direct comparison. This could not be the approach in the depth interviews; a list of topic areas was compiled around which the research had previously skirted. Briefly, these were:

- *Personal information- “tell me about yourself”.*
- *Teaching methodologies- “what do you like about being in the classroom?”*
- *Subject priorities- “what does a student need to succeed in your subject?”*
- *Curriculum differences- “how do curricula demands influence your teaching?”*
- *Student differences- “how do curricula demands influence your students?”*
- *Compare and contrast- “after all you have said, do you see any differences in retrospective curricular analysis?”*

The points above are in question form, mainly for ease of reference; as Oppenheimer (1992:73) suggests:

*“In a depth interview that is going well, there should hardly be any need for questions as such. The interviewer may merely suggest a topic with a word..and the respondent will ‘take it away’”.*

The main advantages of interviewing teachers is the high degree of personal experience they can bring to this particular research hypothesis. Admittedly, there is the ever present problem of emotive subjectivity, particularly if one or the other has a personal interest in the research question. To lessen the chances of this arising, the respondents were merely asked to agree to an interview about ‘curriculum’, with no advanced notice about the research areas. This, together with the topic areas, which were to be gradually built up towards a direct comparison, would hopefully lead to more spontaneous responses. Each respondent agreed to the interviews being taped and 90 minutes was allotted to each session, with a further session, if required, planned for two weeks later. The interviews took place in March 2001.

Two of the respondents had always been teachers, but Ray had worked for three years in a business in Dehli, India. He felt that this gave him a better insight into what Applied Maths can be used for:

*Ray- “When I started my MBA in Dehli, I realised the importance of Applied Maths over pure. This was where I began to question how I had been taught maths”.*

The other two respondents had always wanted to be teachers and they had no doubts that their profession was a vital one:

*Andrew- “In terms of earning a living, there is nothing else I would rather be doing”.*

*James- “I don’t want to be in a classroom all my life, but I do want to be connected to education”.*

The overall impression was that the three respondents had a genuine interest in teaching, saw its importance to students and were sufficiently experienced and motivated to be able to comment meaningfully on the topic areas.

In terms of teaching methodologies, all of the respondents saw the need to establish parameters of behaviour as of prime importance in their classrooms.

*James- “If the students are not paying attention then my subject (Physics) is difficult to begin with. Any breaks in concentration and they will miss too much”.*

*Andrew- “If the little buggers are too noisy, all the best ideas in the world will not help them to understand a tricky situation”.*

*Ray- “Maths is a building subject. If you miss some bricks because of behaviour, the wall will be weaker”.*

Without prompting, there was no natural reference to any perceived differences in the students they had previously taught. It was decided to bring in specific reference later in the interviews.

As far as each of the specific methodologies were concerned, all three tended to rely on the transmission mode; examination success was a major determinant of didactics within the classroom:

*Ray- “I have always had to look towards the end result, wherever I have taught..examinations are important for the kids and for your own confidence*



*levels. If I have to get through a syllabus quickly, then I teach content, content, content. There is not much room for experimentation when you worry about exams”.*

*James- “ All syllabi are too full..you teach whatever it takes to get the students through the exams. Sometimes, practising old exam papers too often is not healthy, but that is what is needed, so you do it”.*

*Andrew- “In History, the content can be all-consuming. You teach examination technique to overcome the time constraints and hope that you have covered topics in enough depth”.*

None of the respondents actually talked about enjoyment of the subject as a primary determinant of student success. The emphasis in the responses was on examination success, rather than methodological variety. Didactic approaches were implied to be extremely conservative, with most emphasis on finishing the content so that examination preparation was at an optimum level. This links in very well to the ALIS/IB questionnaires, where teacher methodologies seemed to be aimed towards the particular approaches associated with specific subjects. Initially, the respondents were to be given the ALIS/IB questionnaire to use on their own teaching, but the conclusion was that ALIS (see Figure 5.3) had covered almost 85,000 student perceptions in that year alone and little could be added to such a large sample size. Nothing that the respondents commented upon changed the basic premise that teachers pursue certain areas of subject expertise in their lessons, depending on their faculty background.

When the interviews turned to the specific subjects, priority areas again centred around summative requirements:

*Ray- “ In Maths, the student must practise every day, like a musician. Many of my lessons are practice, practice...if you forget one part of an investigation, it may lose you the whole question”.*

*James- “Physics is a subject that is acknowledged to be the hardest Science, and in many comparative studies in the UK, the hardest subject of the lot. If my students are decent Mathematicians, then I can get them through the course. This depends on their conceptual understanding as well...some of the theories on*

*forces for example are hard to get your head around and the students have to have an intellectual depth”.*

*Andrew-“History’s requirements are pretty simple; you have to be able to analyse and evaluate pretty complicated situations. Students must be trained to write essays in a concise, analytical way and question evidence to a high degree of professionalism. The other side of this is that they have to be good note takers and be prepared to read around the subject”.*

Interestingly, all three of these teachers are now teaching International Baccalaureate Diploma and they make no separate references to other curricula, ostensibly because they see similar subject aims in whatever curricula they are co-opted to teach. At this stage in the interviews it was still considered more productive to remain with the general subject areas unless the question of comparison came up naturally. However, the primary objective of the study still remained a comparison of the curricula by professionals and the next gradual step towards this was reference to the two curricula.

On the issue of curriculum differences, opinion remained on the same track as the previous set of responses, namely that subjects were very similar in what they wanted from the teacher and the student:

*Ray-“ I tutored Ruyam for her A Level examination in Maths and there were very few areas she did not cover in her IB classes, so, no I do not think that there is much difference between the content demands. In fact, before the IB maths chief examiner changed in 1999, I felt that the IB were trying to do too much and the university standard courses were being tried far too early”.*

*Andrew-“The aims and objectives are almost identical. The IB has more choice as far as coverage goes, but overall I see little difference between the syllabi. Even the examination format is so similar that an A Level student could do an IB exam and vice versa”.*

*James-“ There is some difference between the two but only in terms of content. I think that the aims and objectives are very similar, with the new A Level modular approach helping to make the A Level a little easier in the long run. I think that, on balance, the Diploma course is a little lighter on the mathematical side, but we have less time anyway”.*

The natural comparisons made seem to bear out and explain the previous findings on methodology. As the aims and objectives are so similar, and content coverage is rarely different, why should teachers change their practices? As most International Baccalaureate teachers are state trained, their formative teaching years have probably meant experience in the dominant state system, namely Advanced Level for these teachers (Andrew actually gained his A Level experience in Bangkok, Thailand, but this does not seem to have affected his outlook).

In terms of student differences, the teachers were unable to specify differences between the cohorts:

*Andrew-“ You get the good and bad wherever you are. Most students at this age have sufficient maturity to see what they want and are prepared to work hard, or moderately hard, to get it. You get others who are there for the ride and will not put in the effort they need”.*

*James-“ The main quality of my IB students is that they have so much on their plate and yet manage to handle it all. It doesn't affect me as such, but when I see the homework they get from all their subjects and the other things they have to do such as CAS, I am constantly amazed by their capacity to organise and discipline themselves”.*

*Ray-“ I see no major differences in the students, but I was in a grammar school in Kent before I came here so that is credit to the IB students that I can compare them. In Kent I even had to get new shoes because my other ones squeaked and disturbed the girls. The one main difference between the kids is TOK. I have been invited to teach on the TOK course and it is a very deep thinking course. It goes into subjects and questions that everyone should have the chance to discuss in life. Whether it helps my maths students I can't really say, but I think it is a good experience”.*

In subject specific terms, none of the teachers see any difference between the cohorts. This seems to be supported by other evidence through the study; the fact that there is no significant difference between the economics cohorts, that university personnel make no obvious subject comparisons and universities make

very few subject specific demands from either curricular cohort. Two of the respondents recognise other areas, less subject specific areas, which seem to impact on the student approaches. These have also been cited in much of the study as being of prime importance in the ‘attractiveness’ of International Baccalaureate students in terms of university entry and preparedness for study at undergraduate level.

In the Institute of Welsh Affairs’ (2000: 9) study, the number of universities who cited student involvement in Theory of Knowledge, CAS and the Extended Essay as of prime importance, was 67%. Once more, the study moves towards an area where qualitative research highlights factors which quantitative cannot. Theory of Knowledge is a major curriculum difference, however whether its major assessment aim of ‘higher levels of critical reflection across the subject mix’ succeeds, requires investment in a wide array of psychometric testing materials. Similarly, the levels of self-discipline required to manage such an array of subjects, plus the co-curricular requirements, are difficult to quantify. Lastly, the learning that takes place within the Diploma, as a result of the subject mix the students have to study, is a matter of contention. Previous research into learning and the workings of the brain must unequivocally point towards breadth as the optimum and most valuable course of learning. However the study cannot hope that individual subject teachers will see much beyond the auspices of their own disciplines.

This is obvious in the respondents’ approaches to the final topic area, that of a direct comparison:

*Ray- “I can see no real differences between the A Level and the Diploma. I teach the same way and I also see no real differences in teachers who come to my department from other schools. Sometimes the kids are different; with so many nationalities, you get more happening in the classroom, but this would be the same at a multi ethnic school in England. No, if I was to be given more time to think about the question, I might come up with other answers, but at the moment, no”.*

*Andrew- “Because many are not first language English speakers, you have to spend more time on spelling and writing technique, but apart from that, very little.*

*Cultural influences mean that some students can bring their own personal knowledge or experience of a situation to the classroom and that is a big boon, but in terms of teaching, I see very few differences.*

*James- “ Aside from the demands as I mentioned before, the approaches are fairly common and I don’t see anything else in the Science department which changes that view. Subject similar, perhaps a little more demanding at A Level, students the same wherever you go, and practical work requirements match closely”.*

On the one hand, the answers are very illuminating to the objective of the original research; all the evidence seems to point towards the fact that there is very little difference between the subject demands from the two curricula. In our instructional analysis we have a good basis for refuting the argument that in the pursuit of breadth, depth must necessarily be sacrificed.

## 5.4 Summary

Teacher research undertaken by Hardman and Williamson (1998) finds that:

*Current teacher methodology is dominated by transmissional forms of teaching in which recall or comprehension of authoritarian information are the main goals. Research into the constructivist function of dialogue and learning suggests that classroom discourse is not effective unless students play an active part in their learning. This social constructivist view of learning suggests that our most important learning does not take place through the addition of discrete facts to an existing store, but by relating new information, new experiences, new ways of understanding of the matter in hand (12).*

Most of the teacher methodology findings, across the two curricula, question the kinds of cognitive demands made on the students by subject specific teachers.

There seems to be a teacher tendency to cover content, with the aim of examination recall; the teacher as authority figure who defines what is and what is not important in the content coverage.

Teacher approaches, when viewed from a subject specific viewpoint, achieve little in the way of developing many of the qualities desired by Higher Education, such as abstract thinking, global awareness and intellectual risk taking. As Hardman and Williamson (1998) make clear:

*Critical thinking skills (are seen by many commentators) as being essential, particularly for those students continuing in full time education, who are largely destined for occupations demanding 'leadership qualities' and higher order thinking skills. It is for these reasons that the didactic teaching methods..have often been regarded as inappropriate for inducting able students into the ways of the subject discipline, because it is thought that they fail to develop higher order thinking skills and conceptual understanding (13).*

Figure 4.2 (previous chapter, reproduced by kind permission of the CEM Centre at the University of Durham), highlights clearly the differences in teaching and learning practises over the four subjects, Economics, English, Chemistry and Biology, and clearly highlights the evidence base for different teaching and learning styles. Certain teaching traits are common across certain subjects and this will necessarily mean that students exposed to a limited number of subjects will experience a similarly limited number of different teaching (and learning) styles. In English and Economics, for example, there are clearly dominant strategies displayed in categories 15, 16 and 17; group discussion, class discussion and reading respectively.

As communication skills are so highly valued by the ‘end user’ (specifically, employers) in the education process, such discrepancies help to highlight the areas which could be developed by subject specific teachers, or alternatively, by altering the structure of the Advanced Level curriculum, to include such subjects, where possible. The International Baccalaureate Diploma, with its mandatory coverage, is one means of achieving this breadth of experiences at ages 16-18, and invariably matches the learning needs of students according to the theories of Kolb and other educational theorists Hart (1999), Le Doux (1996), Pert (1999) .

## 5.5 An Illustrative Case Study Analysis

The depth and detail of qualitative methods typically derive from case studies. In this instance the opportunity for case study usage has been limited precisely because of the nature of a comparative study in education. Cases are usually selected because they serve a particular evaluation purpose and there is often the chance to use control groups, carefully selected after rigorous pre-case study analysis. For the purposes of this study such a scenario was impossible; schools devote time and resources, and frequently philosophical beliefs, to their choice of curriculum. Students and parents also use a school knowing what the curriculum will offer. Therefore it was impossible to set up school control groups and enter into a process that Paton (1987: 19) supports:

*"Case studies become particularly useful where one needs to understand some particular problem or situation in greater depth".*

Process evaluations are aimed at elucidating and understanding the internal dynamics of programme operations, in this case a curriculum programme. Process evaluations typically require a detailed description of programme operations, which may be based on interviews and/or observations with users, and administrators of the programme. The effort to generate an accurate and detailed description of a programme lends itself well to qualitative study. Process evaluation is descriptive and inductive, using the qualitative data to supplement other aspects of information support. As the evaluator of these two programmes of study, the investigation must unravel the dynamics of the programmes, with reference to both quantitative and qualitative data. One major concern of this investigation was to assess whether the respective curricula fulfil the needs of the end user, in this case, the higher education establishments in Great Britain. It was seen as vital to assess the end needs of the user before tackling the process of investigating the systems. Questions needing an answer ranged from the following: What do students in the curricula experience? What is the educational service provided by teachers and schools? What qualities are recognised by the end user of the respective curricula?



The case study, however limited in scope, brings some of the questions and the evidence together. This challenge was inherent in the school system however, from the start of the investigation. Curriculum outcomes can be looked at in terms of both quantity and quality of change. The problem with curriculum study is that there is no definitive measure of change, except empirical examination scores. Value added research is changing this situation but this was not available, except for the Advanced Level students and even value added studies remain tied to examination pass criteria. How the educational experience affected the student personally is difficult to quantify and hence the study had to turn more towards qualitative study.

Quality has to do with detail, with subjective judgement and that is the problem that this study cannot change. In the concluding chapter, where triangulation methodology is summarised, the overall perspective on this problem can be studied. The significance of our empirical evidence that there is a discernible difference in outcome, three or four years after leaving the curriculum programmes, can be offered as some linear evidence that the difference in the quality of experience is pertinent. When a large-scale survey reveals particular patterns such as were found in the HESA figures on university achievement rates, qualitative case study data could help to focus the study in particular areas.

Studying a narrow question or area would have produced very clear results, but the support for other areas of research within the study would have been lacking. On the other hand, it was recognised that gathering information on a large variety of issues may leave the evaluation unfocused, with little substantive support again for the other research findings, which may yield other findings and were more likely to lead to support for the other research findings.

Another possible approach available in the time available was to concentrate on individualised experiences and outcomes, whether for students or teachers. This was a unique opportunity as this school was the only one running both curricula concurrently. In this case the logic of purposeful sampling was obvious; here we had an information-rich case study. Admittedly, focusing on such a convenient area of study was problematic; this was a unique experiment, not attempted by

other schools and obviously taking place under the conditions of staffing and resources applicable to its own circumstances. The intention was to recognise shared patterns, which cut across, both the case study, and other evidence collected in the course of the investigation.

Deciding what data to collect in the confines of a school visit was difficult. Getting more data usually costs more and takes longer and there were limited time and financial resources at the disposal of the case study. Studying a narrow question or area would have produced very clear results. On the other hand, it was recognised that gathering information on a large variety of issues may leave the evaluation unfocused, with little substantive support again for the other research findings. It was decided to compromise and look for depth and detail in areas which may yield other findings. Establishing a focus was difficult, but it was decided that, as the International Baccalaureate curricula had been running for only five months, it was premature to study teaching and learning issues. Hence the decision was made to study the pragmatics of curriculum choice, and what factors dictated the direction of both cohorts at age 16.

Very few schools in the world offer a combination or choice of both Advanced Level and International Baccalaureate . An enquiry to the International Baccalaureate Organisation provided the name of a school. 1 which had been offering both curricula for one year. Oakham School in Britain began to run the Advanced Levels and the International Baccalaureate in tandem and agreed to act as the case study institution. A brief history of the school, and its present academic profile is pertinent to the understanding of the study. Oakham School, according to the preliminary discussion with the International Baccalaureate Coordinator, is a member of the Headmasters' and Headmistresses' Conference (HMC), was founded in 1584 by Robert Johnson, Archdeacon of Leicester, for 25 boys. The school, in the market town of Oakham in Rutland, is now a boarding and day school for about 1050 pupils aged 10 to 18. Coeducation is well established, having been introduced in 1971. There are similar numbers of boys and girls and of full boarders and day pupils (about 450); additionally over 100 pupils board for two nights a week. About 85% of the pupils are based in Britain, the vast majority from local counties. Of the 15% based abroad, about

half are British and half foreign nationals, with the largest numbers from the Far East and continental Europe. About 8% have English as an additional language. The school accepts pupils with a range of ability. About 30 pupils enter aged 10. Most enter aged 11 or 14 and some join the school in the sixth form. Whilst the overall ability on entry is above average in national terms, it is broadly average for HMC schools, according to figures supplied by HMC itself (2001:5)

About 60 pupils (6%) are identified by the school as requiring special provision, but no pupil has a statement of special educational need. The school aims to help pupils to develop self-esteem and confidence to adapt to different environments and a world beyond school. It is an evolving school. All pupils maintain a broad curriculum up to the age of 16; many subsequently have taken four General Certificate of Education Advanced level (A-level) examinations. The school is promoting greater breadth post-16 by the introduction in the current year of the International Baccalaureate (IB), the focus of the case study. 93% of pupils have stayed at Oakham over the past five years, until the age of 18, and have pursued their education in universities. Figures given out by the school highlight high attainment levels within the school.

The recently completed Year 11 Average for the last *three* Year 11s (2000):

Students entered for:

5+ subjects GCSE

% Achieved

- 5+ @ A\* - C 93

% Achieved

- 5+ @ A\* - G 99

A Level and AS

- Average score per

Candidate 22(23)

Scoring is 10, 8, 6, 4, 2 for A level grades A – E, and 5, 4, 3, 2, 1 for AS grades A to E.

(Figures in brackets refer to the previous year, 2000)

The overall attainment on entry is above average in national terms, and broadly average for HMC schools, according to DFE League tables (2001).

Some pupils with English as an additional/ second language require individual help with English when they first arrive. Results at A level are good when compared with national averages. About two-thirds of results are graded A or B, with about 40 students gaining all A's. The proportions of students gaining grades A or B and the average point score are well above those for selective schools nationally. About 15 students a year are admitted to Oxford or Cambridge and most go to university or higher education. The overall pass rate has ranged from 95% to 99% in the last four years. These figures highlight a large-scale attitudinal change regarding the introduction of the International Baccalaureate Diploma. Taking into account the Advanced Level scores over the past four years the motivation for the Diploma introduction is pertinent to the study. Despite the impressive Advanced level grades, was the Diploma brought in merely as a recruitment tool, or were its merits recognised?

In recent years, almost every overseas pupil joining the school with English as an additional language has gained at least a grade C in English. Standards in the departments pertinent to the study, namely Business studies, Economics and Politics are broadly in line with those expected, given the students' abilities (HMC 2001: 45) Most students make sound progress in these subjects.

The curriculum seems broad and balanced and provides appropriately for most pupils, including those needing special provision. This relates to the years 7 to 9, in particular; the later years are characterised by the move towards the characteristically limited number of subjects. The progression from a broad range of subjects on entry to specialisation in Years 12 and 13 is well staged however, and the grouping of pupils matches their needs. The flexibility of choice for GCSE is limited. The recently introduced International Baccalaureate (IB) as an alternative to AS and A2 examination courses appears to be an attempt to widen the curriculum choice, but not to replace Advanced Levels.

A five-column option block allows AS and A-level students to take combinations from 22 different subjects. This is supported in Year 12 by a limited General Studies programme. The curriculum in Year 12 is based on

students mainly taking four AS courses, which are reduced to three A2 subjects in Year 13. Some Year 13 pupils join Year 12 classes to study new subjects leading to AS accreditation. Some A-level art is taught in activities time. The Advanced level curriculum conforms to the basis of the study with regard to subject choice at age 16.

The introduction of the International Baccalaureate Diploma as an alternative to A-level in its first year has attracted 50 pupils to its six-subject breadth with 18 subjects on offer in addition to a Theory of Knowledge course. This is in line with the school's stated aims of a broad curriculum. It provides an exciting learning opportunity, according to the school brochure (2000) where high standards are set and pupils respond enthusiastically. The professional development of staff appears to be adequately funded.

The main focus of the study was to be the Economics department, which had the two courses running concurrently, taught in different classes. The Economics department is a sound one, since 1998 the proportion of economics candidates gaining an A or B grade has consistently been at or above the level attained by selective schools nationally and there is little difference between the attainment levels of boys and girls.

According to the HMI report (2001)

*Standards of work are in line with students' ages and abilities. All students participated well in discussions and use the terminology of their subjects well. Students respond well to the teachers' very high expectations. Many students exhibited maturity in their approach to tasks, reading and noting selectively, and contributing in a positive way in class, feeding off each others' ideas (47).*

One of the many reasons cited as a positive factor in using the International Baccalaureate Diploma is the emphasis on Creativity, Action and Service (CAS). In the case of Oakham this is something which poses no threat to the perceptions of the curricula as their programme is already well established and utilised by the students. Community Service involves in excess of 85 pupils

(mainly Years 12 and 13) and a large number of teaching staff who run different aspects of the wide and varied programme, including assisting in primary schools, visiting the elderly or local hospitals and showing a commitment to the environment. Community Service also incorporates work within the school community and the organisation of major events. In view of the extremely wide range of pupils who opt for Community Service, this aspect of both curricula could be judged to impact very little when students are choosing their preferred post 16 route.

In an open question sent to the new International Baccalaureate Diploma students at Oakham, response rate was 50% - 25 from the cohort of 50. The primary consideration here was to investigate the reasons behind the school's implementation of the International Baccalaureate Diploma programme. If it was a marketing device, then the use of Oakham as a case study assumes a lesser role. If it was for philosophical reasons, then we can begin to investigate a unique occurrence, namely that here was a school that already had the Advanced Level and yet other factors had combined to make it less desirable for a large proportion of its Year 12 students.

The answers to the open question were enlightening and served to set a sound basis for the interview with the school's guidance counsellor. 92% of the respondents cited a desire to broaden their post 16 study as one of the main reasons for International Baccalaureate Diploma study. A selection of four of the student responses are outlined below, in answer to the question: "Why did you opt for the Diploma programme and not the Advanced Level?"

*I have chosen to do the IB mainly because it keeps mind and options open. Due to the additions of CAS, TOK and Extended Essay, it shows that the IB is not solely academically oriented. Within the academic side of it, it is also not in any way specialist, as six subjects must be studied from different groups. This has proven very useful to me as I found it practically impossible to choose AS subjects before I learned about the IB. It is universally recognised and highly respected by universities which is a bonus as I am very interested in languages, having lived in France and Russia. (Jessica Leigh)*

The balanced way in which this student sees the advantages of the Diploma programme is mirrored by other students:

*For me, it (the IB Programme) has the best features of all national educational systems, letting you choose subjects of your own interest, but more importantly it teaches you how to cope with everyday problems, how to work in a group and other useful skills. As yet I don't know what to study, fortunately the IB gives me the possibilities of studying at nearly every university in the world (Lukasz Horbacz).*

*I chose to do the IB because I wanted to follow a wider range of options. I knew that my interests outside the classroom were already wide enough to satisfy the needs of the IB and gaining the Diploma would show all universities the full breadth of my talents. I was also interested by the international side of the IB as we live in the information and communication age. Even if I work in England, I need to have a wider knowledge of the outside world. I hope that the IB will make me a more rounded person and in particular through the Theory of Knowledge make me view things with a wider perspective (Simon Collier).*

*The breadth of the IB was what interested me as I was not sure where I wanted to go to university or what I wanted to do later on in life. Having lived in Denmark, Luxembourg and now England, with a very Nordic background the A Level system did not give me all the options I needed. Language is one of my strong points and I am studying both German and French, but at the same time I study Maths, Environmental systems and Drama which creates variety. I also like the fact that everything I do outside school counts as CAS e.g. Duke of Edinburgh, Sports, Music etc. The IB really keeps my options open (Tania Ryoopponen).*

The students' opinions are pertinent to the choice of International Baccalaureate Diploma over Advanced Level, when both were on offer. Once again, they are not based on quantitative data, and neither could they be, but on the ideology of

a broader based programme. Whether the composition of the student body influences IB or Advanced Level choice is a subject for discussion. Is the choice left completely up to each individual student or does the school have some input into the process? It was felt that an interview with Oakham's university and Careers Guidance Advisor, may help to clarify decisions on curriculum choice. The format used was similar to the previous teacher interviews, with the emphasis on open questions in topic areas.

The main aim of the interview was to determine why the school had decided to take the International Baccalaureate Diploma and how the 'selection' to each of the respective programmes occurred. It was considered unproductive to raise issues such as teaching methodologies and summative attainment of students, considering the new programme had been running in Oakham for only five months.

*Interviewer- Why was the programme initially set up?*

*Julia- The programme sells itself. It was set up mainly in response to parental requests for a qualification that allowed students an easy transition from one country to another. Many of Oakham's students do move onto other countries to finish their education, whether at school or university. The Diploma was the natural answer. At the same time, many of our British and 'colonial' parents do not see the Diploma as a natural successor for the Advanced Levels and this means that we had to run both programmes.*

*Interviewer- So it was primarily a marketing exercise?*

*Julia- In a way, yes, that was the primary consideration. But I don't recall any parents specifying the philosophy behind the Diploma as a primary reason for wanting it- it was purely pragmatic. They wanted a useful international qualification and the Diploma fitted the bill. It is highly regarded by all the universities I have spoken to and it can be expensive, but I consider it superior in terms of active student involvement and preparation for higher education.*

*Interviewer- Have you had much teacher and student feedback?*

*Julia- There is widespread approval of its curriculum, which varies little from Advanced Level. In fact I don't think that Oakham specifically recruited teachers with International Baccalaureate experience because they were*



*convinced that Advanced Level teachers could do a good job. I don't think that there have been many problems at all up to this point. Student feedback is more problematic; they like the breadth and variety, but there are reports of overload and complaints that A Level is not such hard work-anecdotal, but these rumours do get around and I hope it doesn't affect future IB enrolment. Oakham already had a community service scheme, which A Level students were involved in, so the CAS component is not causing any problems. The start of the Extended Essay process should be interesting as it will be something that most will not have previously attempted until university.*

*Interviewer- Do you think that there is a large difference in subject difficulty?*

*Julia- Not that I can see- students make their choices based on personal strengths and weaknesses, and I certainly don't see any students going into the Diploma because they think it is easy. In fact, the opposite is true: students take the Morrisby psychometric tests which look at attributes such as 'Science' and 'language' strength and then they come to me for counselling and advice. I try to get them to make up their own minds about which curriculum to choose.*

*Interviewer- Do you think that there is a certain 'type' which chooses one curriculum over the other.*

*Julia- Its certainly a possibility and one for future study, but there are certain traits which stand out, even at this early stage. The students who have a balanced Morrisby profile feel much more confident in choosing the International Baccalaureate Diploma. It holds no fears for them and I can actively counsel them. However, the students who show a strong maths bias, or feel that they are terrible at foreign languages tend to shy away from the Diploma, considering that their best course of action is to concentrate on their strengths and not expose themselves to areas where their weak points will be highlighted.*

*Interviewer- How do you feel about this?*

*Julia- Well, its understandable and I do not try to come down on one side or the other. Until universities and the government begin to see the attractions of students who study maths to 18, or a foreign language to 18, then the students will continue to play it safe.*

*I think that balance is a positive attribute, but schools like Oakham are there to find the best route to university and that means making choices based on strengths, not balance and breadth.*

The interview took place over a two hour period in January 2002, whilst Julia was on a testing programme in Portugal. The time allotment was brief and could ideally have been followed by another interview when more information about the programme was available. This was not possible due to cost restrictions.

What the interview appears to support is the need for mandatory study across disciplines, if the aim of balance in educational endeavour is to be achieved. Julia's personal experience of counselling students into areas of strength is reflected in government figures on student choices at Advanced Level. The government have intimated strongly that they require students to be more 'rounded', yet there is no mechanism in place to ensure this. Universities also offer limited incentives to strive for breadth in study, despite the obvious limitations of subject specialists, who may lack the skills stimulated by a subject adjudged to be an opposite. Previous ALIS evidence has shown that Scientists, for example, spend a minimal amount of class time in group discussion, yet, if those students studied a Language A (literature), their class time would include a substantial amount of oral and group stimulation. This may or may not have positive offshoots, but most research would seem to suggest that exposure to a wider variety of teaching and learning experiences is beneficial.

The case study highlights the high regard in which the International Baccalaureate Diploma is held as it has been a selling point for Oakham, and has consciously been used as such. The fact that the Guidance Counsellor still meets resistance from British parents in particular, when extolling its benefits, raises questions about its marketing. It has not been 'sold' on its philosophy of breadth and internationalism. Further trends will have to be noted, with the future potential to link the curriculum choice process to the psychometric evaluation findings. A major issues which arises includes the motivation of strong subject specialists to remain within their subject areas, thus minimising both academic risk and risk to their university opportunities. In essence, by choosing to

specialise, precisely because the curriculum offers them this, is Advanced Level study depriving its students of more balanced, relevant learning opportunities? It is seemingly the case that pursuit of study in depth bestows fewer recognisable benefits for the students in Higher Education.

In the International Baccalaureate Diploma programme, students do have less choice. It is certainly worth noting the comments from Diploma students regarding their preference for breadth and variety, as compared to a major theme in the interview with the Guidance Counsellor, that of student avoidance of ‘weaker’ areas as a reason to choose the Advanced Level curriculum over the Diploma.

Ostensibly, it is precisely the students who need balance and breadth, before specialising at university, who do just the opposite. Thus the complaints regarding doctors who cannot write or relate to their patients, and humanists and artists who possess minimal numeracy skills, will persist unless there are proactive strategies aimed at minimising such traits.

In case study analysis, the research points to the desirability of breadth, particularly on the part of students who have no fears about following a subject mix which covers the spectrum of disciplines. As Julia, the counsellor at Oakham School commented:

*“The students who have a balanced Morrisby profile feel much more confident in choosing the International Baccalaureate Diploma”.*

This raises another important area of study, namely self-confidence and the issue of how anxiety may be an affective variable in the discussion surrounding curriculum choice. When combined with a conclusion reached by a CEMS (Curriculum Educational Management Study) conference in 2001, whereby levels of self esteem and self confidence were deemed the most important variables in educational effectiveness, it seems pertinent to include this issue.

## THE ROLE OF ANXIETY

### 6.1 Introduction

When studying the returns from the admissions and teaching personnel of British Higher education institutes, one of the main areas where International Baccalaureate Diploma students appeared to 'stand out' was in the area of risk taking (see Chapter 2). Obviously, the comparatively smaller numbers of International Baccalaureate students who enter British universities annually may account for some bias in the perceptions of admissions personnel, however this was an area that needed further investigation. Much of the study had been concerned with teaching and learning, with limited observations of a major factor in all educational endeavours, namely confidence in the educational process.

The objective of this study has always been to recognise that the differences in the International Baccalaureate Diploma student and Advanced Level student in Higher Education is possibly due to the educational process they have experienced, particularly at post 16 level and it is correct that the variables involved in this study are numerous, even down to the earlier educational experience. To study the variables such as family background, other schooling systems and suchlike is beyond the boundaries of this study and this is by no means unique as comparative international studies make little account of background variables: Beaton (1998), Harris (1997), Donne and Robtail (1992), Taube and Mejding (1996). It is the intention to use the quantitative data as a basis for the hypothesis, but to supplement it with qualitative study in order to assess the impact of the other variables.

The reverse side to the issue of self-confidence levels is undoubtedly the anxiety stemming from a particular teaching methodology. That didactics is integrally linked to anxiety levels within the educational process is supported by extensive research: Biggs (1993), Burns (1982), Ireson and Male (1999). However, most is

related to the concept of 'self' with reference to specific teaching methodology such as group work, or the raising of self esteem through life-skills programmes and tutor and parental self-esteem. Surprisingly little has been attempted on the effects of curriculum structure, except indirectly. For example, Lawrence (1996:2) pointed to certain activities which could provide students with the opportunity to take risks and these activities were normally not the usual academic mainstream subjects. He named drama as one area where a poorly perceived self image in school was often reassessed, but playing the role of mentor in their 'expert subject' also fulfilled this function.

It was deemed necessary to study the variable of educational anxiety because the opportunities to enhance self-esteem (confidence) put forward by Lawrence (1996) would appear more likely to arise in the broader International Baccalaureate curriculum, rather than in the more narrow Advanced Level.

## 6.2 Methodology

As the questionnaires on anxiety levels were to be answered with the examination papers, it was judged too ambitious to formulate an open questionnaire, though it would have been useful to do so. The main aim of this section of the study was to provide some explanation for the consistently higher 'ratings' of International Baccalaureate, particularly in the Humanities/Arts university questionnaires, whilst at the same time, retaining the goodwill of the teachers who had administered the examination papers. On the basis that a questionnaire sent out to another sample of schools would place yet another time constraint on the study, it was decided to administer a small, ratings questionnaire, which could be completed at the same time as the examinations and returned with the results. Such ratings questions were easier to answer and much quicker, but admittedly much cruder and less subtle than other forms of questioning.

In order to attempt to separate the background 'confidence' factors such as socio-economic status, or experience of new situations, the questionnaire was sent out as part of the examination completion request and had two distinct parts. It was felt that to try and apply the usual socio-economic criteria would be confusing, particularly for English as a Second language speakers. The normal sampling criteria of levels A-E, as a British classification, would have helped to make judgements about background and the associated factors of educational achievement.

Undoubtedly, many of the international schools that use the International Baccalaureate diploma are private schools, suggesting that their students have school fees to pay and are thus of A or B, or possibly C1 socio-economic background. This could affect how they approach university and how the perceptions of tutors may be similarly skewed to see the Diploma students as 'risk takers' in an intellectual sense. Hence, Diploma students would be said to be products of their home background, rather than of their educational experience. The problem was to overcome this possible source of misunderstanding, without asking them to categorise their home circumstances.

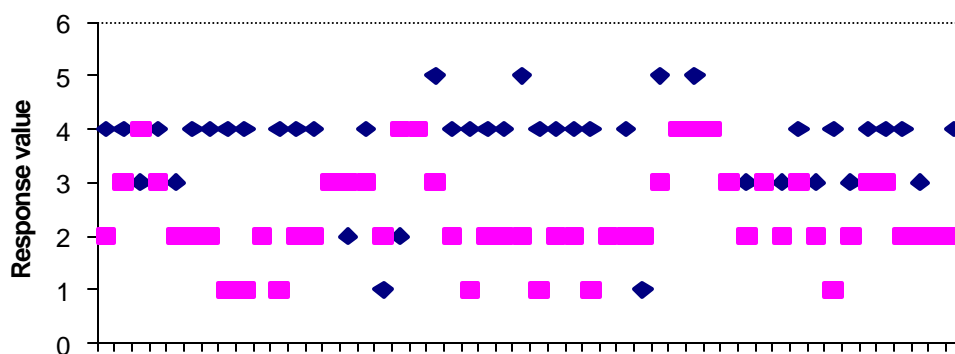
The solution appeared to be if the questions could allow the students to separate their self- perceptions from their academic realities. If it could be shown that their self- perceptions were separate from how they viewed their educational experience, then perhaps it would be a basis for further analysis. The questions were constructed with the following criteria; for the intrinsic motivation measurement the question was general and for the extrinsic motivation it was linked to a university place.

To ascertain the reliability of the questions, the questions were completed internally in three different formats, and then discussed with colleagues. The wordings below represent the clearest form of questions. As there is no other information to refer back to, a check on the validity of the questions is problematic. To ensure greater validity, the sample was widened to include fifty respondents from each of the curricula. In addition, questions 1 and 2 are variations of the same question and it was hoped that the answers received were similar. The fact that this was a direct comparison made the ratings scale less important as far as absolute numbers were concerned. For the purposes of the study, a general idea was sufficient and would give the basis on which to study one particular aspect of the university questionnaires, namely that of 'intellectual risk taking'. The sample populations utilised were exactly the same ones as had been used in the Examination study; namely 1 and 3, disregarding 2.

- 1) *"If I achieve one grade lower than expected in my Economics Examination, it may cause problems for university entrance"- How far do you agree with this statement? (Figure one below)*

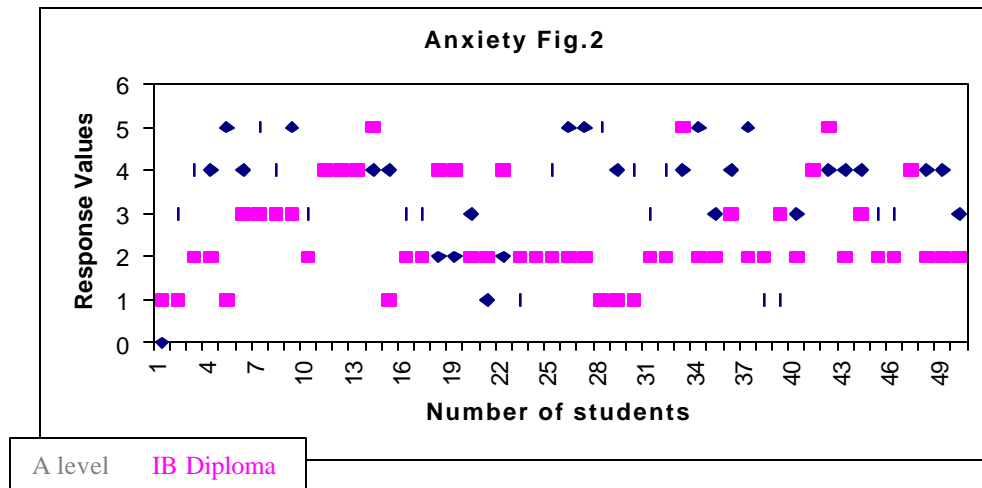
**1 Strongly agree 2 Agree 3 Unsure 4 Disagree 5 Strongly disagree**

**Anxiety study Fig 1**



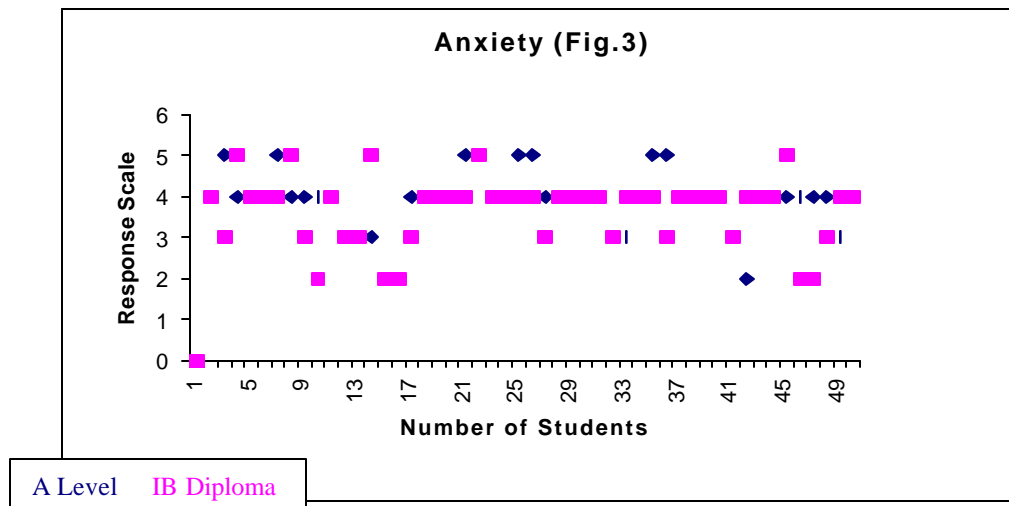
- 2) "How important is it that you obtain your predicted grade in Economics?" (Figure 2 below)

**1 Vital 2 Important 3 Unsure 4 Not very important 5 Not important at all**



- 3) "My courses have been excellent preparation for university and I am confident that I will be able to succeed" (figure 3 below).

**1 Strongly disagree 2 Disagree 3 Unsure 4 Agree 5 Strongly agree**





### 6.3 Findings

In simplistic terms, questions one and two bear out the influence of curriculum structure on student perceptions. When the curriculum contains less breadth, there is a marked increase in the numbers of students preoccupied with specific subject grades in order to satisfy university requirements. An Oxbridge example is pertinent; whereas maximum points are required at Advanced Level in order to fulfil the points requirements of Oxford and Cambridge, the total requirements from International Baccalaureate Diploma students is usually 36 from 45. Whether this correlates directly with anxiety levels is difficult to say; once again a testing programme would have to judge the direct effect on the student cohorts.

In question one the percentage of international Baccalaureate students who registered a response of '4' or '5' was 78%, compared to an Advanced Level score of 36%. Question two responses were less clear-cut, but significant nonetheless. In this case, the split was 50% to 21% respectively. Even accounting for any language difficulties, the effect of study of a greater number of subjects seems to be important to the students concerned. We cannot allow for other variables such as self-confidence levels, which may creep into the findings, despite the care taken in the wording of the questions, aimed primarily at subject specific considerations by the respondents.

Question 3 was another attempt at increasing validity; by turning the scale around, it ensured the appropriateness of response over the questions and the results adhered closely to expectations. In this instance the International Baccalaureate and Advanced Level responses were very similar at the '4' rating, however, there were more Advanced Level students who registered 'not sure' or 'disagree' responses, suggesting that doubts about the educational process remain.

It has been argued that the greatest obstacle to achieving potential within the educational sphere is anxiety. Many researchers point to the way that anxiety can have both short and long term effects on the attainment and attitude of students. Brown (in Desforges 1995: 31) comments that:

*"It (anxiety) interferes with the learning process".*

Studies referenced earlier in the chapter have acknowledged the presence of anxiety in schooling and it is pertinent to ask whether the concept of high stakes examination curricula is a particular barrier to the acquisition of the types of personal learning characteristics desired by universities. To gauge the relative importance of the perceived need to succeed at a particular subject, as opposed to a general register of self-confidence, pointed clearly to the fact that both cohorts have similar variations in self confidence, however when the issue of subject importance arose, the difference was marked. Advanced Level students perceive the grade importance of Economics much more than the International Baccalaureate students. This is supported by findings from Her Majesty's Inspectorate (DFE 1988:43) who concluded that Advanced Level teachers were constrained towards didactic teaching methods by examinations that are narrow, yet claim high rewards as passports to prestigious universities.

In real terms this relates much more to the structure of the curricula, rather than to any implicit difference in the learning strategies inherent in each. This is not to say that this does not directly affect learning, but it may very well allow the International Baccalaureate teachers to experiment more with classes in terms of the 'hidden curriculum'. The explicit teaching strategies are very similar, as our study has already discovered, however what is given when the class engages in written exercises may differ. Do International Baccalaureate teachers use more Applied Economics, for example? This issue is raised in the teacher interviews in the previous chapter and it is undoubtedly the case that teachers recognise the issue of points totals being more important in the context of individual subjects, in the curriculum where each subject has more weighting i.e. the Advanced Level curriculum.

Once again the need for further investigation arises from this investigation. The question of 'high stakes' curricula at age 18 is an ongoing issue, usually with reference to the depth of the subject experience. The 'breadth' argument in terms of 'enrichment' for the student and a better preparedness for Higher Education can be linked to present educational thinking.

The English educational reform (Curriculum 2000) has allowed the introduction of modular AS Levels as a means of broadening the number of subjects a student is able to study in the final two years of school. However, the problem remains that there is no mandatory obligation to choose a breadth of subjects across disciplines. A study by the University of London Institute and the Nuffield Foundation (Times Educational Supplement 12/12/2001: 30) found that 73% of students had increased their numbers of studied subjects from three to four, but concluded that:

*"The additional subject tends to be complementary, rather than achieving genuine breadth".*

The obvious result is that students tend to stick to their 'specialist' disciplines because that is what will allow them to achieve university points totals, with little obligation to move into areas which may challenge them to think in different ways, and no experience of different teaching approaches. Various studies such as Leach (1992) and McFarlane (1993) discuss the existence of a subject culture whereby the subject teachers succeeded as students within the system and are inculcated into ways of learning from a subject specific viewpoint. This could be said to create didactic practices at odds with the demands for a flexible, questioning student. This is not to argue that these practices do not apply to International Baccalaureate teachers too; as was discussed in earlier research, there is much to suggest that subject teachers teach and 'learn' in particular ways, depending on their discipline.

The major difference with International Baccalaureate students however is their exposure to a range of teaching and learning strategies, not due to inherent differences within the subjects themselves but due to the mandatory breadth provided by the programme's administrators.

This means that, in effect, the universities must already have factored in the differences in achievement possible across the range of subjects, and hence there is much less pressure for points in the individual subjects. If we break this down with specific examples; Oxford and Cambridge are very much sought after university destinations, however both have entry requirements which point to them making allowances for the breadth of study associated with the International

Baccalaureate Diploma programme. It should be noted that whilst the basic structure of the Advanced Level curriculum remains limited, usually to only three (or four) subjects, all of the parties concerned will continue to perceive attainment in 'depth' as the most salient outcome. How else can the Oxbridge example be explained, except in terms of Advanced Level specialisms placing much more pressure on the individual student?

The issue of anxiety regarding 'high stakes' examination is documented in many areas of the English education system and has acquired much press coverage. Mr Nick Tate, chief of the Qualifications and Curriculum Authority, stated in the Times Educational Supplement (14/11/2001:21):

*"We have ended up with too many exams and students are now over examined and forced to take examinations on which too much depends".*

The teacher interviews and the student questions highlight this vividly; if students study fewer subjects and there is no obligation to increase numbers, or widen breadth, then the focus on a limited number of subjects, usually in cognate subjects, has been recognised as creating anxiety, bringing with it all the negative factors research has uncovered. There can be little argument that anxiety, stemming from the importance attached to the Advanced Level subjects can be a major negative influence on how a subject is taught and how a subject is learned. In studies of anxiety in both teacher and student, Spielberger (1966) in Sinclair and Ryan (1987: 35) highlighted:

*"The importance of situational factors in understanding the nature of anxiety and its influence".*

Most importantly, the study concluded that there was a significant correlation between teacher anxiety, related to situational factors, rather than behavioural traits, and student anxiety levels:

*"There is abundant evidence that increases in student anxiety will be associated with interference to learning"(69).*

Teacher anxiety can tentatively be said to affect the factors that the ALIS related teaching survey could not survey: namely the affective climate of the classroom and the cognitive framework for student learning. If we enhance this framework

we can certainly suggest that emotion and motivation may be regarded as primary non intellectual determinants of learning and hence achievement levels may or may not be affected (the study of achievement levels within the confines of this particular part of the curriculum study is not relevant), In research by Reinhard Pekrun (1988: 314) test anxiety, is defined by:

*"Expectancies/ valences of failures and their further consequences".*

This was recognised as having deeper consequences than merely academic achievement. Significantly, Pekrun claimed that test anxiety led to a number of behaviour forming characteristics:

1) In situations characterised by freedom of action, the tendency is to avoid performing any risky achievement behaviour at all. Most pertinent to this study, and related to the perceptions of university teaching personnel regarding Advanced Level students, Pekrun claims this situation is most typical for certain laboratory paradigms in the tradition of the risk taking model. If this 'risk taking' is applied to learning situations and choice of a wider range of subjects, we can assume that the Advanced Level curriculum, with its freedom of choice across disciplines discourages risk taking. Test anxiety levels, when measured comparatively are high, and students react accordingly. They realise that the 'high stakes' examination arena requires one grade decrease (see figure 15) and they may face severe difficulties with university entrance.

2) This is not to suggest however, that test anxiety reduces academic achievement. Pekrun (1988: 317) explains that in restricted situations i.e. once subject choices are made, test anxiety may actually strengthen effort motivation: *"In restricted situations the only possible way to avoid failure is to invest effort. Test anxiety should therefore strengthen positive extrinsic effort motivation in such cases".*

If we make direct reference to the two curricula, we are able to make certain assumptions that can be strengthened by further qualitative research. If anxiety levels are high concerning final outcome of examinations then there is certainly a case to be made for the existence of test anxiety. UCAS statistics confirm that the importance of grade differences reported in the Economics questionnaire (see

chapter 2 ) differ markedly between the curricula and less emphasis on subject achievement is necessary in the International Baccalaureate Diploma programme. In simple terms, the practical importance of any one subject is greatly enhanced because the aggregate total of points needed is comprised of a multiplication of six for the International Baccalaureate Diploma, and only three for Advanced Level.

## 6.4 Summary

The findings of the questionnaire give substance to the fact that anxiety levels should be higher amongst Advanced Level students as the curriculum for them is indeed more 'high stakes'. Taking this point one step further; the effects of this test anxiety are difficult to measure without a larger scale study and are outside the confines of this one. Using Pekrun's findings however, which were the most comprehensive evaluation of anxiety and achievement available, it is possible to make a tenuous link to the qualitative findings regarding how teachers and students feel about the two curricula. Contrasts arising from the research thus far suggest that:

- a) The free choice in Advanced Level subjects can, in itself, produce avoidance of challenge and minimisation of risk. This issue does not arise in the International Baccalaureate Diploma, as the breadth across disciplines is mandatory.
- b) This means that teaching and learning strategies in the Advanced Level curriculum are limited to experiencing the approach of only one or two departments. (The effect of this could be moderated by the inclusion of a course such as Theory of Knowledge, but this is not available at Advanced Level)
- c) Pekrun (1988) makes clear that test anxiety does not necessarily affect attainment levels, once restrictions on choice are applied and that this can actually increase positive extrinsic effort motivation. What does arise here however, is the issue of intrinsic motivation. Students put in this restricted choice situation, compounded by the anxiety induced, in this case, by the greater relative value placed on fewer subjects, develop what Pekrun (1988: 317) terms "*declarative motivation*" or "*procedural motivation*". This is where test anxiety is habitualised and exhibited as effort related wants and intentions, in the case of the former, or "direct procedural programmes related to learning and performance". Much of the intrinsic reasons behind study disappear, to be replaced by emphasis on explicit gains.

In various studies carried out by Her Majesty's Inspectorate (HMI) this aspect of the Advanced Level curriculum was highlighted, summarised by Fitz-Gibbon (1997: 13) as “*a qualification..based on the students it is believed to attract-their social origins, ability and likely occupational destinations*” .

If emphasis on learning as a process is replaced solely by emphasis on outcome, then the system is in danger of failing, precisely because all involved in it are looking outward and not inward.

The British Education Minister Baroness Blackstone (TES 19/10/1999) stated that:

*The current system has been criticised for many years for being over specialised and inflexible. Those who want to follow a broader programme often find it hard to do so. This does not serve our young people, or the country, well (18).*

The links to the earlier part of the study are clear: if students follow a narrow choice of subjects (high stakes), the extrinsic reasons for learning can be claimed to predominate. As the commentary on brain research pointed out, the student sees ‘relevance’ precisely because the brain patterns information by linking it to other information. This ‘patterning’ can only occur if the spatial memory has the information from other sources with which to connect.

Many teachers undoubtedly know this and apply the information they impart/facilitate to real life situations, to pictures, to previous lessons and suchlike; all sound pedagogical practices. In the case of Advanced Level however, they receive very little help in this process from the curriculum structure. The subject sits in isolation, in the majority of cases. Teaching methodologies (and it could safely be claimed the ensuing student learning methodologies) assume one typology over particular faculties and the student approach is necessarily limited.

This ties together the major variables within this study: ‘effective’ learning, linked to pedagogic practice, linked to learning styles, all inextricably linked to the structure of the two curricula. This study can then arrive at some general



statements about relationships and offer what Ragin (1991: 34) said was ‘discourse on variables’. In this way it can offer some explanation of the perceived differences in the final ‘product’ of each system, based on the data connected to each of the main variables. In the case of ‘anxiety’, there is evidence to suggest that a narrower range of study leads to each subject, and post 16 schooling, in general, becoming increasingly more valuable and thus more ‘high stakes’. If education is to be viewed as a process, preferably enjoyed for intrinsic participatory reasons, then Advanced Level study appears laden with anxiety, stemming from the extrinsic university entry demands. Whether this affects student output remains an area for further study.

As Modell (1994: 5) in a study on the American system suggests:

*“School is hard, scary work: to carry on effectively, students must have a reason. When American children identify the goal of learning as lying outside of themselves, they learn less effectively and more reluctantly”.*

The outcome of this limited study suggests that Advanced Level students in post – 16 Economics experience higher levels of pressure, perhaps stemming from taking fewer subjects, than their International Baccalaureate counter-parts. Admittedly, the survey questions were based around extrinsic reasons such as the reward of a university place, but valuable nonetheless in highlighting indirectly student perceptions about curriculum structure and the effectiveness of each mode of preparation for university. A full battery of psychometric analysis would be required in order to fully assess anxiety levels under the different curriculum structures, however the questions did set a basis for further investigation, with results to assess against other areas of the study.

## CONCLUSIONS AND RECOMMENDATIONS

### 7.1 Summary

Relating back to the problem statement, it is suggested that International Baccalaureate Diploma students are not disadvantaged, due to their mandatory study of a greater number of subjects, in their level of preparedness for university entry. Indeed, as this study was drawing to its tentative conclusion, OFSTED (The Office for Standards in Education 2003) published a report, implicitly supporting a baccalaureate-type curriculum, by criticising the Curriculum 2000 project, the British government's initiative to broaden the English and Northern Ireland curriculum. The Times Educational Supplement (21/03/03) described the initiative thus:

*It (the curriculum) followed ministers' complaints that the curriculum was too narrow and inflexible, preventing students from competing with their European peers. Pupils were encouraged to take at least four AS exams in Year 12 and then at least three A2 exams the following year. Curriculum 2000 also introduced new vocational qualifications, advanced extension tests for more able students, and key skills qualifications to encourage an improvement in communication, number application and computing (3).*

Of value in terms of this particular study are the latest conclusions from OFSTED, summarised in the Times Educational Supplement (21/03/03):

*Teachers have little time and scope to teach beyond the immediate requirements of the specifications, however important they consider that greater breadth to be for the long-term benefit of the students. Very few schools and colleges required students to pick contrasting AS subjects. Such a reduction in breadth nullifies the purpose of Curriculum 2000 and suggests a lack of commitment to the underlying principles (3).*

Inherent in the above is a strong suggestion that teaching and learning are implicitly affected by curriculum structure, but not why. The study has gone some way towards establishing a research base on which to assess this 'why'.

One of the major problems in both the implementation of Curriculum 2000 and this particular study was the shortage of International Baccalaureate Diploma data, together with a surprising dearth of British Governmental comparative studies regarding the research basis for 'breadth'. The latter was all the more so perplexing due to the ongoing debate about replacing Advanced Levels with an alternative structure of post 16 assessment, with Curriculum 2000 as the main basis.

As the study progressed, the wide range of data needed and the coverage necessitated a research base more limited in depth than was originally envisaged. It is generally recognised that there are strengths and weaknesses inherent in any means of data collection strategy. Using more than one data collection strategy enables the study to combine strengths and correct or check weaknesses. When the study was first planned there was a tendency to approach it in purely qualitative terms; there was almost no quantitative data base on the issue and certainly no direct quantitative comparisons made. Therefore the 'pure' approach-taking case studies and stimulating an inductive approach to fieldwork analysis seemed the most appropriate option.

When the time came to approach the main themes of the study, it was acknowledged that the international nature of the International Baccalaureate Diploma made a mixed approach desirable. This decision was not taken lightly as it is recognised that such an approach is not without its critics. Advocates of whatever methodological approach stress often that a study cannot be both deductive and inductive. The feeling was however, that the nature of the hypothesis allowed for both approaches; the scope was sufficiently wide to allow for a measure of being able to research pre-determined questions, whilst retaining a naturalistic approach. The study attempts to understand both specific cases and the programmes as a whole; it has never been possible within the confines of the

comparative nature of the study to take each variable separately, but to move back and forth between the complexities of the whole picture.

As the case study opportunities were limiting, to say the least, the needs of triangulation were obvious. There is already controversy regarding qualitative data as a 'stand alone' indicator of any aspect of a study. Cronbach (1980) generally supports a mixed approach to data collection, and dismisses any suggestion that data collection can be truly objective. What he advocates is a balance of breadth and depth, realism and control so as to permit reasonable "extrapolation".

What resulted from the study were conclusions wholly conversant with anecdotal evidence regarding the benefits of greater curriculum breadth. Such a large comparative study faced many problems, not least the huge discrepancy in sample population size between the two curricula, however the move in England and Northern Ireland towards greater breadth in the form of Curriculum 2000 supports much of the study's findings and it can be adjudged a positive development in terms of teaching and learning in post-16 educational terms. Whilst not advocating a move towards the International Baccalaureate Diploma, OFSTED (Times Educational Supplement 21/03/03) did call for:

*The government and schools to take action on 11 recommendations; these include encouraging students to mix and match their qualifications and providing schemes of work for teachers that allow them greater responsibility for lesson content(3).*

## 7.2 Conclusions

The study involved many major aspects within the teaching and learning of 16-18 year olds and the evidence tends to point to certain tentative conclusions:

- i) University attainment amongst International Baccalaureate Diploma students is higher, if based on summative results. Chapter two provided two sets of data which highlighted the higher number of 'first' degrees awarded to International Baccalaureate students. The cohort sizes warrant need for caution, but a variable of some value is that English is a second language for almost 76% of the International Baccalaureate students sent by the named international school and if this is typical, the achievement of 'firsts' assumes more significance.
- ii) The pursuit of 'depth' in subject specialisms, reflected in the greater proportion of hours spent on Advanced Level subjects, has a significantly less than proportionate effect on subject knowledge and understanding, as evidenced in the comparison of Advanced Level and International Baccalaureate Economics testing in chapter three. This study was limited to only one subject, so caution in interpretation is recommended, but the complexity of Economics and the conceptual demands it places upon individuals (named 4<sup>th</sup> most difficult subject in an Advanced Level study by Fitzgibbon in 1994, based on correction factors applied to a range of Advanced Level subjects) certainly make application to other subject areas pertinent.
- iii) University admissions personnel recognise the different qualities of their International Baccalaureate students, though this is negligible in the Science cohorts and much more obvious in the Arts /Humanities, as evidenced by the studies in chapter two.
- iv) Anxiety Levels, in relation to a specific subject like Economics are higher in the Advanced Level cohort than in that of the International Baccalaureate, but there is no empirical evidence to link this to other areas of the study. Findings are detailed in chapter six, but the study methodology is detailed with the examination comparison process in chapter two.

v) There would appear to be no discernible differences in teaching styles within the two curricula, as evidenced by the survey on economics students and the teacher and student interviews in chapters four and five.

The variables within a study such as this one are numerous and consequently an effective, definitive end product is not possible. It can be observed that quantitative data points to the difference in degree classifications and perceptions of admissions personnel; we can also recognise that qualitative study gives us a clearer picture of student or teacher perceptions regarding the relative merits and de-merits of each of the curricula. However, what results is a sound basis for future study through an instructional analysis of the different curricula.

The hypothesis that the International Baccalaureate Diploma is a more effective preparation for British universities than the Advanced Level system is proved by most of the evidence. It refutes the claims that ‘depth’ and the pursuit of a ‘gold standard’ Advanced Level qualification are preferable and more useful than study in greater breadth, and points to both qualitative and quantitative findings as indicators that the International Baccalaureate Diploma students are not lacking in subject specific knowledge and understanding. This latter assertion is the main criticism of a baccalaureate type approach; time spent in a subject somehow equates with a particular depth of subject attainment. In all chapters there is evidence which contributes to the opposite assertion; study in breadth cannot be quantitatively correlated to hours spent, nor to summative attainment.

In Economics at least, time spent on a subject does not correlate with significantly greater understanding within that particular subject. University admissions personnel seem to recognise this with regard to the Humanities/Arts faculties, as they rate the International Baccalaureate candidates higher in most major attitudinal categories. The Sciences faculties do not share these perceptions, perhaps useful in showing that, overall, admissions personnel do not ‘grade’ their students differently because the International Baccalaureate students are more noticeable in their ‘smaller’ numbers. This gives greater substance to the Humanities/Arts findings and as chapter two shows, the perception that

International Baccalaureate students possess superior study skills is supported by discrepancies in degree results and more open-ended questioning of admissions officers in chapter 4.

Where the causes of these apparent differences in the end product of the two curricula lie is not as simple to determine. The thesis has concentrated on teaching and learning within the two curricula and attempted to offer explanations of the differences in end product, namely the students, with regard to past studies and evidence of what constitutes 'effective' teaching and learning. The structure each of the curricula employs is offered as the main reason for differences and a number of attendant issues arise. These would include how much importance a subject assumes to the individual if it is one of many other subjects, how much value is gained from simultaneous inter-connected knowledge of other subject content and how different teaching and learning styles may impact on the student. In discussing the issue of curriculum structure it must be recognised that the breadth is not only determined by the number and nature of subjects, but more importantly, by whether each individual's learning requirements include a mandatory breadth.

The whole process is fraught with danger of unknown variables, which have not been accounted for within the confines of this study. The socio- economic backgrounds of international Baccalaureate students are not documented, unlike the Advanced Level cohorts. State systems employ this type of data collection as a matter of course. However, the nature of international education means that such data is unavailable. If the discernible differences in the students are due to such socio- economic factors then any curricula analysis is superfluous. The only answer that can be supplied here is that in international comparative studies between countries sampling rarely, if ever, takes account of socio economic backgrounds as the logistics are far too complicated.

Evaluating the effectiveness of the curricula is a sophisticated task. In 1971, Stufflebeam recognised that educational evaluation would always be problematic because there is no uniform end product. Value added theory is an attempt to remedy this situation, however this can only work if students experience an

identical starter process. In the case of this study, a quantitative starter comparison is impossible because of geographical differences, but the inclusion of ‘softer’ qualitative data, to support the quantitative data we collected aids the evaluative process immensely. This approach is supported by Cronbach (1963), Stake (1967) and Stufflebeam (1971), all of whom recommended a widening of perspectives to include a variety and range of data sources.

In methodological terms, the study pursues a case for predictive validity. The testing of students in Economics took place across different continents and most teachers reported that they had been able to administer the tests within the same session. In the use of a form of split half reliability method, the study intended to formulate high reliability levels by allowing the collection of two scores from the same set of people. This method depends on the selection of questions as a basis for reliability, but, as they were taken from actual examination papers, it must be assumed that they were representative of the respective syllabi, particularly when supported by examiner comments regarding the ‘appropriateness’ of the year’s questions.

The Economics data are the ‘hardest’ evidence the study possesses as a direct comparison measurement. Most evaluators recognise that judging the merit of a programme of study is a difficult task unless such evidence has yardsticks or standards against which we can apply judgement. As Stake (1967:536) pointed out, frequently in education we do not have absolute standards against which we can make our judgements. We can attempt to take variables and subject them to closer study before reaching a decision in comparing systems, but the study acknowledges the limitations of this whole ‘relative comparison’ issue. Stake (1967:536) summed up the dilemma:

*It is a judgmental matter to determine whether one programme betters another with regard to a single characteristic, but there are many characteristics to attend to and the characteristics are not equally important.*



An inductive approach however, has led to the consideration that the structure of the International Baccalaureate Diploma results in a student markedly different to the Advanced Level student. The study can offer explanation for its main findings, but Stake's (1967) points remain; we cannot weight how the different teaching and learning characteristics affect the quality of the programme and we cannot even define what 'better' usually means. As with many educational issues it is conducive to turn to theories without empirical basis to explain this situation.

The study has no alternative approaches to offer; most behavioural Sciences face philosophical disagreements. Despite the controversy about 'right' and 'wrong' learning theories, there is still much to be recognised in different theories which may very be the key to understanding the attraction of the Diploma in universities. The study has looked at how students learn and in Constructivism theory (detailed below) the emphasis is on learning being a search for meaning, mainly through understanding the 'whole' rather than the 'parts'. Constructivism is only one of many schools which call for educational systems which encourage 'wholes' to be considered at least as importantly as 'parts' in the search for innate meaning and the need for the brain to pattern. Most learning theory agrees on many aspects of how learning takes place: most agree that effective learning takes place when the student is able to construct his or her own meaning by drawing on a range of information. Self-construction allows students the opportunity to store understanding in the spatial memory, rather than the rote memory.

Most theory also highlights the need of the brain to pattern, to focus on concepts, rather than isolated information; this is something which subject specialisation alone can damage. The study has linked emotions to the issue of effective learning: much of our research has shown that anxiety levels are consistently higher in Advanced Level cohorts than International Baccalaureate. In the search for meaning in schooling it is widely researched that anxiety levels impair certain types of learning. Most brain theory asserts that emotions are critical to patterning: if meaning and relevance are recognised then the intrinsic value of learning is enhanced and knowledge is stored in longer-term memory.

The study cannot show empirically that these factors are positively correlated to the differences in curricula cohort. Indeed there is no evidence to suggest that the didactics of the different classrooms sway any more favourably towards developing learning and human brain theories. Modern schooling systems seem to invite criticism. Without doubt the two curricula studied pursue understanding based very much on subject specialisation, through the lens of rational, objective analysis, with undue regard for interdependence and inter-relatedness- processes which show brain patterning to be so important in effective learning. This is not to suggest that the structure of the Diploma programme and its constituent ‘extras’ are not factors which move the curriculum ahead of its rival in terms of educational futurology.

Constructivism, discussed with reference to teaching and learning in chapter four, calls for the elimination of standardised curricula, requiring educators to focus on making connections between facts and fostering understanding of the ‘whole’. Teachers are asked to rely heavily on open-ended questions and promote extensive dialogue among students. In terms of assessment, Constructivism calls for an end to grades and standardised testing and examinations. Whilst this is an extreme curriculum change, there are many possible bases along the educational spectrum at which to stop. The Diploma programme can be claimed to have adopted much of the Constructivist approach, debatably consciously or unconsciously. The didactics of the various Diploma and Advanced Level classrooms vary widely, significantly not across curricula, but across common subject approaches, characterised by the subject being taught.

Diploma students are exposed to a wide variety of teaching styles, hence their education is necessarily more open. A factor that makes the Diploma more open ended is the innate need to make sense of the world. As the Diploma student must follow such a variety of disciplines, the raw materials of understanding grow accordingly. The effect on the individual student must ideally be gauged, however, as with much in education, this is extremely difficult on an empirical basis, but is certainly an area for further research.

As subject specialists, many teachers gravitate towards particular areas of Kolb's learning theory. Is this because they were exposed to the particular learning and teaching styles within their own education? If so, will more of a balance of exposure to different learning and teaching styles give the student more of a balance within Kolb's, and does this in turn make them better equipped to take advantage of different learning conditions? Much of the evidence points to the fact that 'specialised' teaching and learning is a limitation to effective learning. Whether a person is a particular 'learner' from birth or influenced by the major players in his or her education is another area for further research, but the more teaching and learning styles exist in the education of a person, the more effective that person will be in being able to adapt and respond to future experiences. The Theory of Knowledge course is commonly perceived by universities as an invaluable aid to cut through subject boundaries.

### 7.3 Recommendations

The question of how curricula can be adapted to meet the needs of students (and universities) more effectively is contentious, however the framework arises naturally from the study. Summarising the contents of much educational literature, effective curriculum must be all, or a great majority of the following, according to new guidelines drawn up by the National College of School Leadership (2001: 12):

- Contextual
- Strategic
- Academic
- Reflective
- Pedagogical
- Ethical

- Contextual- it must see itself in a relationship with the wider community and world. It must have teaching and learning content and skills which provide relevance to its students and teachers, with the underlying structure to create an understanding of the 'whole' supported by the 'parts'.
- Strategic- it must have aims and objectives, not only shared by everyone, but which also act to underpin its purpose. If there is no intrinsic justification for its existence, then extrinsic reasoning is weak and ineffective in comparison. Its mission statement must be a resounding support for its very existence.
- Academic- it must put value on high quality study and scholarship. It must encourage and facilitate an ethos, characterised by pupils' questions, and search for meaning. Its standards must be such that the learning process is held in high regard by the organisations it is intended to serve.
- Reflective-It must be a system of education which provides data on the progress and achievement of its students, used as a basis for questioning the system itself. It must also provide the means for students themselves to question the nature of learning and effective schooling.

- Pedagogical- it must be a system in which teaching learning is regularly evaluated, which keeps pace with educational theories and adapts its training and curriculum structure accordingly.
- Ethical- it must be a system which promotes open access and the concept of educational entitlement is held in high regard. The curriculum understands the nature of learners and what learners want.

### 7.3.1. The International Baccalaureate Diploma

The International Baccalaureate Diploma programme is recognised as fulfilling most of these criteria. In terms of its overall philosophy, the curriculum tries to instil a sense of global awareness and responsibility. Through its CAS programme students are encouraged to look beyond themselves and their local environment, and instead towards the international environment and the ethics of globalisation. The academic requirements and standards of the curriculum are unquestioned by any institutions within the confines of the study, with an emphasis on applying the academic to a world context, as stated in the mission statement of the International Baccalaureate Organisation. The reflective component of the course is provided by the TOK course and the involvement of teachers in its course construction. Indeed, some schools are allowed to run their own courses under the auspices of the IBO's stamp of recognition. For all of its positive qualities, other aspects of the effective curriculum criteria detailed previously are not met.

In strategic terms, the Diploma and the International Baccalaureate Organisation as a whole must concentrate resources more carefully on what makes the Diploma intrinsically different from other curricula. In marketing the curriculum, the mission statement and the intrinsic reasons behind the Diploma are not widely recognised. Many of the students and teachers during the course of the study have mentioned the university possibilities through the Diploma and the sought after 'breadth' because of how the curriculum is structured. However, few deliberate on the philosophy of the International Baccalaureate Organisation, something that would stimulate an intrinsic motivation to study. In pragmatic terms, this would suggest that schools need more display materials and input from the organisation itself.

In reflective and pedagogic terms, the Diploma still has limitations and certainly a need to incorporate more applied subjects, or allow Diploma qualification with two languages B's (second languages). The study found that over 75% of those that take the Diploma in English, outside the USA, UK and Canada, are second or third English language speakers. It is astonishing that these students are able to take Higher Education courses and achieve more Class1 degrees than their

Advanced Level, mainly English-speaking counterparts. Data is not available to give nationality or language breakdowns; it may very well be that the Class 1 degrees are gained by first language English speakers who have completed the diploma. However it is evident that the Diploma makes little allowance for students who enter the Diploma with weaker English language skills, and their success would appear to be in spite of Diploma requirements, rather than because of. It is also a fact that many international schools have Special Educational Needs requirements (ECIS 2000), and in this too, the Diploma makes few allowances. The call for more practical subjects originates from the perception that the diploma is very academic; a greater choice of applied subjects would greatly enhance the study opportunities for both Students of ESL and Special Educational Needs.

In terms of curriculum pedagogy, the Diploma does not adhere to the criteria previously outlined. The most common criticism raised in such a broad curriculum is the one of overload. It appears that there is a cost to breadth and this materialises in the form of work and time pressures. Many assume that the pressures of work correlate positively with academic rigour, but this does not necessarily constitute a healthy situation. The fact that Economics students, with almost 33% less teaching time behind them, performed well on an Advanced level multiple choice paper, highlights the fact that content and understanding seem to be well covered. It can be argued that this indicates the time burdens on the teachers and students, which exist, but are somehow overcome.

Little can be done about this situation, except to cut down on subject time or the number of subjects studied. One recommendation is however, that subject teachers make greater use of the pedagogic opportunities afforded by the programme. In both our interviews with teachers and in the perception of students as to the importance of single subjects within the university application process, we can recognise greater opportunities for subject teachers to experiment with content and process. The studies on teacher methodology showed that Advanced Level teaching and International Baccalaureate Diploma teaching were strikingly similar, but what could make them differ is the 'high stakes' nature of the curricula is definitely more 'high stakes' within Advanced Level, and is popularly

perceived so by both students and teacher, as highlighted in the short study on anxiety in chapter six.

What the studies in pedagogy showed in chapters four and five was that disciplines adhere closely to extremely conservative practices. Teacher-led discussions predominate, with little evidence of skilful and reflective pedagogy. Unimaginative, conservative teaching methodologies seem to predominate, leaving content coverage as the major aim. Time pressures and constraints arise, not from lack of understanding, but from the rush to cover content. This too flies in the face of recent developments in learning theory, cognitive psychology and Constructivism. As discussed, it is fortunate indeed that the structure of the curriculum, rather than the pedagogy which predominates within it, is a major reason for the flexibility of the Diploma student when it comes to them being judged by Higher Education institutions.

Incorporating a varied methodological approach within the Diploma specialisms can only enlarge on the student benefits imbued by the broader curriculum and the exposure to varied pedagogy. Constructivist, brain research based strategies are applicable to a programme which can draw on the students' experience of the Theory of Knowledge programme (seen as instrumental to student success by university entrant personnel in chapters two and four). For enhanced levels of cognition and meta-cognition it is conceivably worth sacrificing a certain amount of content coverage. This would, in turn, help to alleviate the inherent time pressures.

In pedagogical terms, the teachers interviewed in chapter five all omitted to mention training or professional development of any kind within the International Baccalaureate programme. It was noticeable that two of the teachers commented that teacher pedagogy varied little and they made reference to other personnel in their departments as 'proof', as it were, of teacher development. None mentioned that they had any research grounds on which to base their assertions, nor did they mention speaking to other teachers about methodologies. When taken together with the questionnaires from students in chapter four, it seems pertinent to call for more comprehensive training for teachers within the International Baccalaureate



Diploma; training to include research awareness on effective learning and pedagogy.

Insomuch as the International Baccalaureate Diploma is administered by an international foundation, it would be advisable for the International Baccalaureate Organisation to assume greater powers of responsibility with regard to the overall quality assurance aspect. State systems have a central body of legislation concerning issues such as trained teacher status, teacher conditions of service, training provision and other aspects of education which form the foundation of any system, whilst the IBO appear to maintain a curriculum stance. This may have been a successful strategy in acquiring new converts to the Diploma programme, however the growth in numbers probably necessitates greater involvement in issues only indirectly connected to the curriculum.

- Should Diploma teachers be required to have accredited IBO teacher status, following a centrally determined period of specialist pedagogic training?  
Much of what the International Baccalaureate Organisation is committed to achieving in educational terms, will undoubtedly suffer if the teachers who teach its programmes, are inadequately trained or unaware of its commitment to global understanding and its 'learning how to learn' pedagogic core belief. This limited study has shown that pedagogic practices do not fit into the Organisation's vision for the future.
- Must the Organisation set, what it considers, effective structures in place through which schools can facilitate pedagogic discussion; these may include set training plans, specific time allowances for co-ordinators of the Diploma programme, class size guidelines, staffing contractual parameters and other suchlike 'guidance'? All practices through which state systems attempt to apply quality assurance.
- Should the International Baccalaureate consult with government leaders more tenaciously, in order to provoke more widespread acceptance? As the university study shows, some universities still discriminate against Diploma candidates. As this happens in Britain, where the IBO has its assessment headquarters, it signals towards other such difficulties in other areas of the world, where perhaps it is not as well known.

The essential point is how much curriculum and administrative control could or should the International Baccalaureate Organisation assume in order to maintain the implicit quality of its teaching programme. As the demand for its programmes grow, then the pressures on its infrastructure will begin to challenge its philosophical ideals. Ostensibly the use of the International Baccalaureate Diploma programme as a 'fast track' in the USA (Thomas 1988) is in direct opposition to the open access ideals of the Diploma programme. However, the revenue from this area of the world is undoubtedly welcomed and such situations will become more common unless the International Baccalaureate Organisation take greater control of the school accreditation process. As this study has highlighted, the Diploma programme contains much to commend it to any college or university, but this is due to the internal workings of the curriculum structure and has little to do with pedagogy and/or centralised quality assurance procedures. This must be the next step forward.

### 7.3.2 The Advanced Level Programme

When relating this programme to the criteria for what makes an effective curriculum, certain difficulties arise. In a ‘contextual’ sense, the curriculum is shown to be seen as a preparation for higher education, with minimal practical usage. In point of fact, most of the HMI reports quoted in the body of the study are extremely critical of its structure and relative lack of higher order thinking skills requirements. In terms of ‘strategic’ qualities, two of the larger Advanced level examining boards have no mission statement, whilst the Cambridge group’s (quoted earlier) is extremely basic and has little strategic vision. The one main area of strength of the Advanced Level curriculum is the ‘academic’ criteria. There is no doubting the high esteem enjoyed by the qualification, across a spectrum of end users. The concept of study in depth remains a powerful force in the ‘academic’ field. The ‘reflective’ content of the curriculum, concentrating on statistical measures of success, is also strong. Arguably however, the opportunities for true reflection on the merits of the curriculum have not been taken-the Dearing Report of 1996 is a prime example of genuine attempts at change being severely diluted by conservative forces. In ‘pedagogic’ terms, the study has highlighted minimal differences in teacher (highlighted in chapters four and five), when Advanced Level is compared, however curriculum structure appears to offer a sounder pedagogic base if that structure offers a grounding in genuine breadth.

This point is substantiated empirically by examination and degree class comparisons in chapter two and widespread anecdotal evidence on the part of university teaching and entry personnel in the body of the study. The Advanced Level offers this to only a limited few, as studies on cross-disciplinary take up highlight clearly. In terms of the ‘ethical’ criteria, Advanced Level does not offer open access; the anxiety studies clearly show that the study of a limited number of subjects must necessarily lead to a situation where students opt for other routes. According to the Department for Education and Employment –DFEE (1999) the percentage of the population of people qualifying with 2 Advanced Level (or equivalent) was 40%. In Germany this figure was 63%, in France 58% and in Singapore 50%.

The need for reform to the Advanced level system is gathering pace, but what form this reform will take will provoke great hostility from the ‘traditionalists’, (examples detailed later in this section) who continue to perceive the system as the best preparation for university study. The main factor under consideration, namely that study in depth ensures a thorough understanding of subject matter is a contentious one, particularly when studies of economics attainment highlight minimal differences in understanding, on one aspect of testing, at least. Added to this must be a fear that different examination boards, with different aims and objectives can never set an examinations agenda which fully satisfies the requirements of such a variety of students and universities.

The British government, as a matter of course, must begin to look at its longer term aims and objectives, with regard to examination syllabi; if the International Baccalaureate Organisation can put forward a mission statement which encapsulates the aim of its curriculum, then the Advanced Levels need just such a step. Debatably, organisations and institutions involved in teaching and learning, without an intrinsic purpose, are set to fail. Most of the criticism of the Advanced Level curriculum is based around its extrinsic need for examination success. If that is all it has become to teachers, students, parents, governments and employers alike, then there is certainly cause to question its existence as the main engine of post 16 learning in England and Northern Ireland. Wales has already made moves towards its abolition, with calls for its replacement with the new Welsh Baccalaureate.

The move towards a curriculum body, which can assume an independent identity, can only occur if the British government reviews the number and the nature of the existing examinations boards. It must substitute them with an independent body, characterised by sound pedagogic principles and a philosophy that encourages the role of learning in intrinsic, as well as extrinsic terms. The OFSTED Report (Times Educational Supplement 21/03/03: 3) claimed this approach as negative, in that:

*“Teachers were unduly prescriptive in lessons, giving pupils too little opportunity to learn for themselves”.*

Whether this transcends to a review of curriculum structure is another matter. An independent examinations body would be a political neutral and thus it would possibly attract less opposition, however as this study has shown, the moves towards a broader curriculum have been vehemently opposed for the past decade at least. If the structure was to change, it may very well be a return to the limited range of subjects formerly offered, before the introduction of AS and A2 Levels in Curriculum 2000. This latter development has, as been noted, met with severe criticism and many calls for it to be abolished. Unfortunately, its introduction had been intended as a base on which to pursue a curriculum of greater breadth, but the voluntary nature of the choices meant that its aim fell away, as students concentrated on the subjects of personal strength. Nevertheless, the philosophical foundation for broader study areas has been set in motion, and it would be a positive move if these calls for reform were to include a call for mandatory breadth.

The breadth issue was also tackled by the introduction of ‘core skills’ components in 1998, components in numeracy in particular which were felt to be long overdue and would certainly aid vocational endeavours after graduation from university. Once again, this met with only a small measure of success. Universities, which had expressed the need for more numerate undergraduates, appeared to ignore them in their entry points criteria. In a search of the University Clearing Advisory (UCAS) service’s points requirements booklets in 1999, universities do not expressly offer credits for the broadening of the Advanced Level curriculum through the core skills components.

Once again, if the study is to recommend the broadening of the curriculum in England, Northern Ireland and Wales, it must do so knowing that the very institutions that appreciate the International Baccalaureate graduate have not explicitly acknowledged the importance of individual students’ academic development under the Advanced level system.

If a change in the structure of the Advanced Level curriculum faces strong opposition, as undoubtedly it will, then reforms such as the key skills components

will help to provide a limited amount of breadth. What would undoubtedly also help is the inclusion of a critical thinking course, similar to the Theory of Knowledge course in the International Baccalaureate Diploma. This has already been mooted, but with no decision being made by 2002, at least. There has been widespread awareness that subject specific teaching does and should develop critical thinking skills, but also calls for this to be done explicitly, outside of, and in addition to, subjects. Dewey (1909:9) called it ‘reflective thinking’ and defined it as:

*“Active, persistent and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends”.*

What he implies here, is very much in line with the aims of the Theory of Knowledge course; what matters are the reasons we believe something and our questioning, not only of the knowledge, but also the grounds on which it is based. In the earlier evidence, gleaned from an IWA questionnaire, it is apparent that universities appreciate the Theory of Knowledge course. Any system which is willing to offer a subject that encourages and promotes meta-cognition, critical thinking, is clearly moving towards an educational process which takes influences and theories of knowledge and understanding from a wider range of disciplines. The anecdotal evidence is overwhelmingly in favour of such a move and the Advanced Level system would benefit accordingly.

Such is the level of disagreement within British politics regarding any broadening of the Advanced Level curriculum, that even individual subjects have been submitted to much criticism. Woodhead in *Bughes et al* (2002), a former chief inspector of schools for HMI (Her Majesty’s Inspectorate) recently published an attack on any type of broadening of the curriculum:

*Our enthusiasm for a broad and balanced Mathematics curriculum means that many key mathematical concepts will be missed by the majority of candidates. The advent of modularity appears, moreover, to be making this already serious problem, worse (147).*

He continues his criticisms by advocating a return to depth, and abolition of the curriculum change:

*The current and new system of modular examinations at AS/A level with AS and A2 modules, restricted combinations, strange re-sit conditions is getting out of hand. It does not provide a framework for all to show their ability and is therefore, failing to deliver the supposed justification (148).*

Despite the evidence pointing to the contrary, there seems to be little vocal support for a structure which advocates breadth over depth. Emotive sentiments have dominated the debate over the past two years, exacerbated by examination marking problems and timetable clashes within the new AS/ A2 structure. These sentiments appear to signal an end to any attempts at widening subject choice. Marenbon in *Burghes et al.* (2002) states:

*It is by no means clear that the A level examinations provide better assessments than some of the simpler types of tests used abroad, nor that what schoolchildren study for English A Levels is as intellectually valuable as the courses in other Western countries, either as a basis for further academic work in the same field, or as preparation for other academic courses, vocational training or work (46).*

In the same Advanced Level study, his colleague, Tombs (2002) makes similar criticisms of History:

*Judged within this comparative context, the most problematic features of the British A Level- AS/ A2- and Highers syllabuses are the limited range of knowledge that they impart, and the decontextualised, fragmented and amorphous nature of that knowledge. The emphasis is upon history as an approach to, rather than a body of knowledge. The current A Level History course provides a very impoverished historical education (62).*

Such criticisms could be said to be motivated by political considerations, but until some comparative research looks at such claims, then the conservatives will continue to hold the dominant hand. In the case of History for example, Tombs makes no reference to the intrinsic value of historical study. If Advanced Level has been designed towards the challenges of further historical study then his calls for coverage in depth would appear to be justified. The fact remains, however, that less than 50 % of History Advanced Level students elect to sit History at university. Does that mean that his calls for a chronological approach, as in the United States, or the “*logical organisation and presentation of data and ideas, rather than argument or researching interpretation*” (60) as stressed by the French system, carry more weight in terms of educational research? Of course, the answer is ‘no’, but until the British government researches comparative studies and comparative curricula, such as the International Baccalaureate Diploma, such arguments will continue to exist and undermine the best efforts of teachers to make the curriculum relevant to as many students as possible.

The study cannot claim that the areas in need of reform exist solely in the Advanced Level arena. In contact with teachers and students in the International Baccalaureate Diploma programme, areas of concern were raised.

Both curricula appear to lack the impetus for change, admittedly with much stronger forces ranged against the Advanced Level. If changing educational practices are judged by the speed at which they keep pace with societal change, then the technological revolution, coupled with the environmental impact findings, should be accommodated within school curricula. However, as long ago as 1988, Brundtland in The Brundtland Report, compiled for the United Nations commented:

*Rates of change have not been matched by the education system; most of the planning assumes a slow moving world outlook. In essence most of the characteristics of world systems of education are based on fundamentals that existed in the past, unexamined assumptions of how things are, rather than how they have become (31).*



It has been argued that the present curricula carry the burden of an industrialised past, that there is a widening gap between the knowledge structures propounded by schools in the past and present and the needs of an increasingly technologically proficient society. Can education reasonably argue that its teaching methodologies and subject base has changed sufficiently rapidly? Brundtland (1988) comments on the lack of educational innovation to deal with changing world needs:

*New subjects to the curriculum, particularly ecology, tend to assume a peripheral role, with the main influence still on subjects which have always dominated. How these subjects relate to the modern age is an issue for discussion (31).*

This criticism can be applied to both of the respective curricula, but the potential for change is greater in the International Baccalaureate Diploma; indeed the use of accredited school based courses is made more possible because the overall range of subjects allows extra inclusion. These include Peace Studies, Ecology and trans-disciplinary subjects such as Environmental systems. Debatably there is a need for the inclusion of such subjects on a mandatory basis.

The changes now taking place mean that the teacher assumption that the students' knowledge and understanding of a particular subject is the major indicator of accomplishment, must necessarily change too. In the light of social, economic and technological advances, together with the burgeoning understanding of brain/learning processes, our perceptions of success must move away from subject attainment and more towards diverse aptitudes and attitudes. Education must be prepared to assess a student primarily on aptitudes such as finding, using and interpreting knowledge, rather than simply assessing their approaches to the knowledge given. The sum total of knowledge available to the human being is now doubling every two years or so and testing based on the old style model is inadequate.

Incorporation of facilitating and giving credit for collaboration, leadership, articulation and problem solving is a necessity, and as the world moves towards

technological advances in computer generated essays, through voice stimulation, the distinctions drawn between written and oral abilities will begin to disappear. In many ways this and the other more 'generic' needs of the future may very well challenge the high stakes examination structure on which both of the curricula are based. A Carnegie Foundation report (author unnamed) in 1993 implied that the use of examinations is questionable:

*The problem of examinations is not primarily one of discovering more accurate and technical methods of constructing and scoring examinations. The problem of examinations strikes at the very roots of the whole meaning and significance of education in society...the essence of the problem is the validity of education (151).*

Whilst not being able to establish any clear pedagogical differences between the two curricula, it is undoubtedly the case that the International Baccalaureate Diploma comprises more of the essential ingredients for change, slow moving or otherwise. Its very structure allows for much greater study flexibility and student awareness, across a range of disciplines and learning styles. Perhaps it is only when curriculum designers automatically assume that study in breadth is essential to the personal development of each individual, can education truly claim to be a process built upon intrinsic motivation. If it can claim no identity, other than as a means of extrinsic gain, then it is a process without foundation.

As Horsley (2000) comments on the process of educational change:

*It (change) can only take place when teachers see beyond the confines of their own subject and their own classroom. Teachers who fail to do so, and who insist that their role is merely to develop the highest possible knowledge base in their own subject, are doing their students a disservice (10).*

The same can certainly be said of curriculum designers and educational pressure groups. To attempt to change teaching and learning methodologies within the same curriculum structure, research shows, invariably meets with failure.

Hardman and Leat (1998) comment:

*A new (subject) curriculum offered from above...does not replace the existing curriculum. Instead there is a process of adaptation which leaves old teaching styles and patterns of interaction largely untouched  
This suggests that different subjects have a model style of teaching and learning, which in turn suggests that there are subject cultures  
(366/367).*

If change and innovation cannot be easily accomplished through subject reform, then curriculum innovation is another option. The most effective innovation, supported by the findings in this study, would appear to be a mandatory broadening of curriculum, but whether the British government has the necessary political will to advocate this course of change, remains to be seen.

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## APPENDIX 1 HESA CLASSIFICATIONS AND ADMISSIONS

**Higher education (HE) students** are those students on programmes of study that are of a standard that is higher than the Advanced Level of the General Certificate of Education (GCE A-levels), the Higher Grade of the Scottish Certificate of Education (SCE Highers), or the BTEC or SCOTVEC National Certificate/Diploma (ONC/OND).

The HESA student record contains information about individual enrolments, which, because a student can be enrolled on more than one programme of study, will exceed the number of students.

The **HESA qualifications obtained population** is a count of student enrolments associated with the award of an HE qualification (excluding HE credits) during the period 1 August 1995 to 31 July 1996 inclusive. It does not include dormant students (awards from dormant students are tabulated separately). This population includes all qualifications obtained during the 1995/96 reporting year, which were returned to HESA by 15 November 1996.

### *Level of qualification*

**First degree** includes first degrees, first degrees with Qualified Teacher Status/registration with the General Teaching Council for Scotland, enhanced first degrees, first degrees obtained concurrently with a diploma and intercalated first degrees.

### *Highest Qualification on Entry*

It should be noted that a student's **highest qualification on entry** is not necessarily that required for entry to the institution. Categories used are:



**Postgraduate qualifications (excluding PGCE)** includes all postgraduate degrees, diplomas and certificates excluding the Postgraduate Certificate of Education (PGCE).

**PGCE** - as described.

**First degree of UK institution** - as described.

**Other graduate and equivalent qualifications** include graduate qualifications obtained outside the UK, NVQ/SVQ level 5 plus any other qualifications at graduate level not listed above.

**HE credits** include Open University credits and credits from other UK HE institutions.

**Other HE and professional qualifications** include certificates and diplomas of education, HNC or HND (including BTEC and SCOTVEC equivalents), diplomas in HE, NVQ/SVQ level 4 and professional qualifications.

**GCE A-level, SCE Highers and equivalent** - as described plus ONC or OND (including BTEC and SCOTVEC equivalents).

**A-level equivalent vocational qualifications** include GNVQ/GSVQ level 3.

**ACCESS courses** - as described (both accredited and unaccredited).

**GCSE/O-level qualifications only; SCE O grades and Standard grades** - as described.

**Other qualifications** include International Baccalaureate, foundation courses, GNVQ/GSVQ levels 1 and 2, NVQ/SVQ levels 1 and 2, and any other qualifications not listed above.

**No qualification required/held** - the institution does not require the student to hold a qualification on entry or it is known that the student has no qualification.

**Not known** - nothing is known about the student's qualifications on entry to their Programme of study

### *Classification*

Certain qualifications obtained at first degree level are not subject to classification of award, notably medical and general degrees. These, together with ordinary degrees, are included within the pass/unclassified category.

## **APPENDIX 2- TEACHING AND LEARNING QUESTIONNAIRE**

## **APPENDIX 3- UNIVERSITY PERSONNEL RATINGS QUESTIONNAIRE (IB)**

**APPENDIX 3- UNIVERSITY PERSONNEL RATINGS QUESTIONNAIRE**  
**(ADV)**

## **APPENDIX 4- LETTER AND OPEN QUESTIONS FOR UNIVERSITIES**

## **APPENDIX 4 (cont).**

## APPENDIX 5 UNIVERSITY POINTS REQUIREMENTS IN ECONOMICS AND BIOLOGY

|               | Bio/Adv | IB | Diff. | Ec/Adv | IB | Diff. |
|---------------|---------|----|-------|--------|----|-------|
| ABERDEEN      | 18      | 30 | 0     | 16     | 26 | 0     |
| ABERYSTWYTH   | 18      | 26 | 8     | 20     | 28 | 8     |
| BIRMINGHAM    | 24      | 32 | 8     | 24     | 30 | 6     |
| BRUNEL        | 20      | 26 | 6     | 18     | 26 | 8     |
| CENT.LANCS    | 14      | 28 | 14    | 12     | 24 | 12    |
| DE MONTFORT   | 16      | 32 | 16    | 10     | 28 | 18    |
| DUNDEE        | 18      | 29 | 11    | 16     | 25 | 9     |
| DURHAM        | 24      | 30 | 6     | 24     | 30 | 6     |
| EAST ANG.     | 22      | 30 | 8     | 20     | 30 | 10    |
| ESSEX         | 22      | 30 | 8     | 18     | 28 | 10    |
| HUDD.         | 14      | 26 | 12    | 10     | 26 | 16    |
| KEELE         | 20      | 26 | 6     | 20     | 31 | 11    |
| KENT          | 22      | 31 | 9     | 20     | 28 | 8     |
| LANC.         | 22      | 28 | 6     | 18     | 28 | 10    |
| LEEDSU.       | 22      | 30 | 8     | 24     | 32 | 8     |
| LEICESTER     | 20      | 30 | 10    | 20     | 30 | 10    |
| LUTON         | 14      | 32 | 18    | 12     | 32 | 20    |
| NEWCASTLE     | 22      | 30 | 8     | 18     | 26 | 8     |
| OXFORD        | 28      | 36 | 8     | 28     | 36 | 8     |
| PLYMOUTH      | 14      | 24 | 10    | 14     | 24 | 10    |
| QUEENS        | 22      | 30 | 8     | 18     | 27 | 9     |
| READING       | 22      | 31 | 9     | 18     | 29 | 9     |
| SHEFFIELD     | 22      | 30 | 8     | 22     | 30 | 8     |
| ST ANDREWS    | 22      | 30 | 8     | 22     | 28 | 6     |
| WALES         | 22      | 30 | 8     | 20     | 28 | 8     |
| ULSTER        | 18      | 28 | 10    | 14     | 26 | 12    |
| WARWICK       | 28      | 34 | 6     | 22     | 30 | 8     |
| WOLVERHAMPTON | 12      | 24 | 12    | 8      | 24 | 16    |
| YORK          | 24      | 32 | 8     | 24     | 32 | 8     |



## **APPENDIX 6- CURRICULUM AIMS AND OBJECTIVES (ADVANCED LEVEL)**

**APPENDIX 6 (cont.)- CURRICULUM AIMS AND OBJECTIVES (IB  
DIPLOMA)**

## **APPENDIX 7 – DIPLOMA SCHOOLS CONTACTED WITH QUESTIONNAIRES**

## **APPENDIX 7 – ADVANCED LEVEL SCHOOLS CONTACTED WITH QUESTIONNAIRES**

## **APPENDIX 8- UNIVERSITIES CONTACTED WITH QUESTIONNAIRES**

## **APPENDIX 9- TEST PAPER A**







**APPENDIX 9 (cont.) TEST PAPER B**





## **APPENDIX 10 TEST PAPER TEACHER COVER SHEET**





