Predictability in the Irish Leaving Certificate Examination

Working Paper 2: Examination Materials Research

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This research was sponsored by the State Examinations Commission (SEC) of Ireland. Ruairí Quinn, Minister for Education and Skills in Ireland, announced this project and his commitment to tackle any problematic predictability in the Leaving Certificate examinations.¹

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Introduction

This research is part of a wider programme of work investigating the predictability of the Irish Leaving Certificate higher level examinations. Students typically sit six to eight subjects for the Leaving Certificate examination.

The Irish Minister for Education and Skills, Ruairí Quinn, requested an independent external investigation into the predictability of the Irish Leaving Certificate examinations. The State Examinations Commission (SEC) appointed the Oxford University Centre for Educational Assessment and Queen’s University Belfast to research the issue.

Here, we report a review of examination materials spanning the years 2003–2012 that was conducted by 13 subject specialists from outside of Ireland across six subjects: biology, economics, English, French, geography and design and communication graphics (DCG). Predictability in examinations is not necessarily problematical; it is the negative effects that it may have upon learning that could be problematical. The research questions go beyond whether the topic and format of the examinations are predictable because concerns about predictability are linked with deeper issues of the kind of learning associated with examining systems. Previous relevant research, conducted in other countries, has linked formulaic, predictable examinations with drilling, teaching to the test and superficial learning. The research questions for this programme of work are listed below. Emboldened questions are tackled in this part of the programme. Those questions not tackled in this part of the programme were investigated through the other strands of the research (see information in brackets):

1. **What is known internationally about the effects of high-stakes examinations upon teaching and approaches to learning, particularly in relation to predictability and rote learning?** (literature review)
2. **What kinds of learning are the examinations intended to promote?**
3. **How predictable are examination questions in the Leaving Certificate in Ireland?**
4. **Which aspects of this predictability are helpful and which engender unwanted approaches to learning?**
5. **What are the syllabus and assessment design phenomena associated with predictability?**
6. **What subject-specific phenomena are associated with predictability?**
7. **What kinds of examination preparation strategies do teachers and students use? Which of these are influenced by the predictability of the examinations?** (literature review, questionnaires with students, interviews with teachers and students)
8. **What issues should be addressed in an Irish context in relation to the levels of problematic predictability identified in the Leaving Certificate examination?**² (all aspects of the research programme)

This research does not investigate classroom practice, but participants were able to investigate the kinds of performances that are credit worthy in the examinations through a number of examples of

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²Note that recommendations will not be made until the final report, when all parts of the research programme are complete.
students’ examination booklets. Given the wide research questions and concerns, some of the issues identified in this analysis (eg transparency of the marking schemes) require some explanation to show how they are linked. Subtle issues like these can have far-reaching effects, but small changes may also have a large impact upon the kinds of teaching and learning signalled by examinations. In this working paper, we discuss predictability in positive and negative terms, as elements of predictability can be desirable and it was our intention to uncover both sets of features. We indicate the subject specialists’ views about the overall problematical predictability of the examinations, taking into account the balance of features present in each subject.

Arising from the literature review, we have the following working definition of predictability:

A problematically predictable examination is one in which teachers and students can anticipate the test-taking conditions, performances required, question formats and topics and scoring to the extent that undesirable effects upon the educational process are pervasive. These include narrowing of the taught curriculum, superficial rote learning, drilling on test content and failure to develop a broad and deep understanding of a subject. Such an examination lacks validity because it measures test preparation narrowly rather than the intended assessment objectives. Predictability is likely to foster reliability (consistent measurement), but this may be at the expense of validity (measuring the right knowledge and skills).

Predictability in examinations is not always negative, as people need to know what is expected of them in the examination. Whether we have to answer multiple-choice questions, perform a piece of music or write an essay needs to be known so that we can prepare for examinations. Some aspects of predictability could add validity to the assessment. Table 1 shows the characteristics and effects of examinations being predictable and unpredictable in relation to their curriculum coverage, the test conditions, question format, performance format, scoring and examination support materials.

**Table 1. Elements of examination predictability**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Predictable</th>
<th>Unpredictable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Curriculum coverage</strong></td>
<td>• Topics that will be assessed known in advance</td>
<td>• Topics to be assessed not known in advance</td>
</tr>
<tr>
<td>Description</td>
<td>• May not need to study the breadth of material intended</td>
<td>• Do not know how to prepare for the exam</td>
</tr>
<tr>
<td></td>
<td>• Teachers may narrow the taught curriculum</td>
<td>• Performance based upon luck of studied curriculum-exam match</td>
</tr>
<tr>
<td></td>
<td>• Teachers must judge which aspects of the syllabus to teach</td>
<td>• Teachers must judge which aspects of the syllabus to teach</td>
</tr>
<tr>
<td><strong>Test conditions</strong></td>
<td>• Known in advance</td>
<td>• Not known in advance</td>
</tr>
<tr>
<td>Description</td>
<td>• May be variable</td>
<td>• May be variable</td>
</tr>
<tr>
<td></td>
<td>• Test performances can be practised</td>
<td>• Students’ capacity to adapt is part of the assessment</td>
</tr>
</tbody>
</table>

A problematically predictable examination is one in which teachers and students can anticipate the test-taking conditions, performances required, question formats and topics and scoring to the extent that undesirable effects upon the educational process are pervasive. These include narrowing of the taught curriculum, superficial rote learning, drilling on test content and failure to develop a broad and deep understanding of a subject. Such an examination lacks validity because it measures test preparation narrowly rather than the intended assessment objectives. Predictability is likely to foster reliability (consistent measurement), but this may be at the expense of validity (measuring the right knowledge and skills).
<table>
<thead>
<tr>
<th>Feature</th>
<th>Predictable</th>
<th>Unpredictable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment format</strong></td>
<td><strong>Description</strong></td>
<td>• Nature of the assessment may vary</td>
</tr>
<tr>
<td></td>
<td>• Nature of assessment (eg written, oral, practical) is known in advance</td>
<td>• Weightings given to different components may change</td>
</tr>
<tr>
<td></td>
<td>• Weightings of assessment components are known</td>
<td>• Novel question styles are used frequently</td>
</tr>
<tr>
<td></td>
<td>• A set format for questions, perhaps even related to specific topic areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and question choice, is known in advance</td>
<td></td>
</tr>
<tr>
<td><strong>Possible impacts</strong></td>
<td>• The phrasing and structure of questions can be explained to</td>
<td>• Teachers can prepare students to think about what is required to respond</td>
</tr>
<tr>
<td></td>
<td>students in advance and they can be taught test wisdom</td>
<td>to different question styles</td>
</tr>
<tr>
<td></td>
<td>• Teachers can school students on how to produce the kinds of</td>
<td>• What is being assessed changes</td>
</tr>
<tr>
<td></td>
<td>performances required</td>
<td></td>
</tr>
<tr>
<td><strong>Performance format</strong></td>
<td><strong>Description</strong></td>
<td>• Match between performance required and student skills will affect results</td>
</tr>
<tr>
<td></td>
<td>• How students will be required to respond is known in advance</td>
<td>• What is being assessed changes</td>
</tr>
<tr>
<td><strong>Possible impacts</strong></td>
<td>• Teachers can school students on how to produce the kinds of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>performances required</td>
<td></td>
</tr>
<tr>
<td><strong>Scoring</strong></td>
<td><strong>Description</strong></td>
<td>• Information on rubrics is not available</td>
</tr>
<tr>
<td></td>
<td>• How performances are credited is known openly (eg transparent marking</td>
<td>• Credit given to responses may vary</td>
</tr>
<tr>
<td></td>
<td>schemes published)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Detail is known regarding scoring</td>
<td></td>
</tr>
<tr>
<td><strong>Possible impacts</strong></td>
<td>• The scoring criteria is learnt rather than the syllabus materials in an</td>
<td>• Students may not know how to gain credit for their work</td>
</tr>
<tr>
<td></td>
<td>extreme case</td>
<td></td>
</tr>
<tr>
<td><strong>Examination support</strong></td>
<td><strong>Description</strong></td>
<td>• Little information publicly available relating to the examination questions</td>
</tr>
<tr>
<td></td>
<td>• Past papers available publicly</td>
<td>• Examination materials may be kept secure</td>
</tr>
<tr>
<td></td>
<td>• Model answers accessible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Advisory materials from the examination board, such as examiners’ reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Textbooks closely aligned with examination questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other publicly available information, such as newspaper examination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>guides and advice, teacher publications etc</td>
<td></td>
</tr>
<tr>
<td><strong>Possible impacts</strong></td>
<td>• Too much focus upon the assessment rather than the syllabus content</td>
<td>• Examiners can advise students about examination preparation far better</td>
</tr>
<tr>
<td></td>
<td>• Students may gain marks from superficial approaches to learning</td>
<td>than those not involved with the examinations</td>
</tr>
<tr>
<td></td>
<td>• Examiners can advise students about examination preparation far better</td>
<td>• Students may not know how to gain credit in the examinations</td>
</tr>
<tr>
<td></td>
<td>• Students may gain marks from superficial approaches to learning</td>
<td></td>
</tr>
</tbody>
</table>
Method

Reviewers

A total of 20 reviewers investigated the examinations materials. Fourteen subject specialists were engaged: two for each of the subjects (three for French) and one for the pilot phase of the research (geography). They were selected for their experience in examining these or related subjects for examination boards in England and Northern Ireland (12) or were higher education teacher–educators (1). The subject specialists’ experience is given in Appendix A. Four experienced assessment researchers (Ahmed, Baird, Elwood and Hopfenbeck) and two doctoral students (Barrance, Ryan) also conducted the reviews. The purpose of the assessment researcher reviews was (a) to familiarise the researchers with the examination materials and (b) to focus upon non-subject-specialist issues. In the event, the subject-specialist and assessment-researcher ratings were very similar. However, the subject specialists were able to give much richer qualitative comments, so only their comments are reported.

Examination materials

Six subjects were investigated, selected to give a broad perspective across curricular areas with a variety of examination components and a large number of students: biology, English, economics, French, geography and design and communication graphics. Mathematics was excluded from the review due to the ongoing work on Project Maths. The materials circulated were:

- An outline of the Secondary Leaving Certificate (Appendix B)
- A syllabus
- A teacher’s guide
- Appendix 5 on command words from the SEC publication Manual for Drafters, Setters and Assistant Setters (Appendix C)
- Higher level examination papers from 2003 to 2012
- Higher level marking schemes from 2003 to 2012
- Students’ responses to the Higher Level 2012 examination
  - five scripts at each grade, A, C, D and E, giving a total of 20
  - oral examination recordings for French
  - project work for design and communication graphics (from 2013)

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2 www.ncca.ie/projectmaths
3 The biology syllabus changed in 2004 and the geography syllabus changed in 2006. Design and communication graphics was introduced in 2009. Previously there had been a technical drawing syllabus.
4 There were exceptions to the general pattern: French – one fewer grade E script, giving a total of 19. Geography – no grade E scripts, giving a total of 15. Design and communication graphics – paper copies only were available, so each of the two subject experts were sent two scripts at each of the grades, giving a total of eight scripts.
5 These were scrutinised in an additional workshop held on 30 October 2013 due to logistical problems in the materials being available for the 9 July meeting. Twenty-one oral recordings and 12 projects from the SEC archive were scrutinised.
**Pilot**

Dr Roger Firth (geography education subject expert at Oxford University) undertook the data collection exercise on materials for two years of the geography examination. We amended the data collection instrument to reduce the workload on the reviewers and clarify some of the instructions in response to his comments.

**Data collection**

Subject experts were asked to conduct their initial reviews of the Leaving Certificate materials and complete a data collection sheet (Appendix C) remotely and independently. They were then brought together for a workshop to discuss findings with other subject experts and the project team (Appendix D gives the programme).

The data collection instrument was divided into four stages. First, reviewers familiarised themselves with all of the materials by reading through them. Stage 2 involved choosing a pair of consecutive years and making a closer reading of the question papers and mark schemes for those years. Stage 3 was a rating exercise and Stage 4 was composed of open-ended questions. The rating exercise involved rating the similarity of examination materials across years. Reviewers were asked to rate pairs of question papers and marking schemes in terms of their similarity on a number of dimensions:

- Content covered
- Skills required
- Intended difficulty
- Command words
- Question wording
- Question type/format
- Layout
- Resources

The idea of similarity was used because examinations can be predictable in a range of ways, as indicated in Table 1. Ratings of similarity on a number of dimensions across a time period helped to identify predictability over that period and the open-ended questions involved the identification of patterns across time. The first three dimensions are deep-level features of the examination (content covered, skills required and intended difficulty) whereas the others are surface-level features. We asked the reviewers to rate each pair from 2012 and 2011, going back to 2004 and 2003. Making judgements on the similarity of pairs should be a more straightforward task than making predictability judgements for each year, as it is a relative rather than an absolute judgement. No definitions of predictability or other information from the literature were shared with participants in advance of the workshop, so that the initial data collection was unbiased by previous work.

The workshop began with discussions of the ways in which examinations can be predictable, the benefits and disadvantages of predictability and the meaning of predictability. The differences between similarity and predictability were discussed. Findings from the examination materials review were discussed initially in subject teams (two or three specialists and a project team...
member). Comparisons of ratings and the reasons for them were made and in some cases ratings were adjusted after discussion. Each subject team then shared findings in an inter-subject plenary and common issues as well as differences were discussed and noted.

**Analysis**

Inter-judge agreement was analysed in advance of the workshop for each subject. There was a high level of agreement. Table 2 shows that two thirds of the ratings between subject specialists were identical and 88% were in adjacent categories on the same side of the rating scale, meaning that they disagreed only on whether the materials were ‘quite’ or ‘very’ similar or dissimilar. These figures were higher following workshop discussion and it is the consensus ratings produced by subject teams following discussion of the rationale for the ratings that are used in this report. Very few disagreements regarding ratings remained after discussion and these are drawn attention to in the reporting below. As such, consensus ratings reflected a full consideration of features of the examinations. Comments from subject specialists in the initial data collection exercise (Appendix C) and from reports of the workshop were coded thematically and are reported in the results section.

**Table 2. Percentage agreement on ratings of examination materials**

<table>
<thead>
<tr>
<th>Subject</th>
<th>% complete agreement</th>
<th>% agreement on similar/dissimilar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>68%</td>
<td>98%</td>
</tr>
<tr>
<td>Economics</td>
<td>54%</td>
<td>71%</td>
</tr>
<tr>
<td>English</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>French</td>
<td>93%</td>
<td>100%</td>
</tr>
<tr>
<td>Geography</td>
<td>67%</td>
<td>88%</td>
</tr>
<tr>
<td>DCG</td>
<td>40%</td>
<td>90%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>66%</strong></td>
<td><strong>88%</strong></td>
</tr>
</tbody>
</table>

**Review process**

A draft of this working paper was forwarded for comment to Irish subject experts nominated by the State Examinations Commission, the Department of Education and Skills, and the National Council for Curriculum and Assessment (NCCA). These comments were considered before the report was finalised. A research advisory group also commented upon a draft of the report.

**Results**

In half of the subjects, there was concern that the examination materials displayed predictability of a type and extent that was potentially problematic: economics, French and design and communication graphics. Biology and geography were rated as ‘neither predictable nor unpredictable’ overall and the English experts did not reach a consensus, as there were facets of the examination materials considered to be predictable, while others were not. In this section of the report, we first consider
the ratings of the materials and the main themes arising from coding of the qualitative responses. We then go on to look at subject-specific findings.

Table 3 gives the consensus ratings arrived at after each subject specialist had made their own ratings and then discussed them with other specialists at the workshop. The top three rows of the table (in bold) refer to the more substantive elements of the examination, and the others are the surface features. The intended difficulty of examinations should be very similar from year to year to maintain standards, but variations in questions will produce fluctuations that standard-setting processes must address. In most cases, the intended difficulty of the examinations was viewed as very or quite similar. Only in the case of English Paper 1 was there a view that the intended difficulty was sometimes quite different, due to the variation in text demands.

Reviewers agreed that the content (topics and examples that come up each year) should not be entirely predictable. In the area of content the picture was divided, with reviewers rating the content of geography, design and communication graphics, French and English Paper 2 as quite similar in general, year on year. Figure 1 indicates that questions set annually in geography on landform development were similar. Content predictability in French was thought to be due to the wide range of topics on the syllabus, such that only very general questions could be asked of any topic. The aural was considered to be more predictable than the written papers. Although candidates were presented with a range of news items, subject specialists considered that students could have been prepared on a narrow range of likely topics, such as accidents, crimes, weather forecasts and so on. However, in economics, biology and English Paper 1, the content was rated as quite different (Table 3). The skills required were rated as being similar year on year for every subject, as indeed they should. Ratings for similarity of the skills required were higher than those for the content similarity in each subject.

Reviewers considered that the question formats and question paper layout should be predictable to avoid assessing construct-irrelevant demands (unintended demands). Ratings for the surface features of the examinations were mainly ‘very similar’ and we can conclude that these examinations are predictable year on year with regard to surface features. The notable exception was for resources in English and in this case variability was seen as a positive feature of the examinations. The reviewers valued the variability in texts, images and graphics in Paper 1 and some variety in the wording in set-text questions in Paper 2.
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended difficulty</td>
<td>4</td>
<td>4</td>
<td>2/3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Content</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Skills</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Command words</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Question wording</td>
<td>4</td>
<td>3/4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Question type/format</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Layout</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Resources</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Key: 1 = very different  2 = quite different  3 = quite similar  4 = very similar
Figure 1. Geography questions on landform development

2012 Question 3B

Answer (i) or (ii).
(i) Explain with the aid of a labelled diagram(s) the formation of one landform of deposition that you have studied.
Or
(ii) Describe and explain one process of mass movement that you have studied. [30m]

2011 – No comparable question.

2010 Question 2B

Answer (i) or (ii)
(i) Examine, with the aid of a labelled diagram or diagrams, the processes that have led to the formation of any one Irish landform of erosion or deposition of your choice.
Or
(ii) Describe and explain one mass movement process that you have studied. [30m]

2009 Question 1C

Examine, with the aid of labelled diagram/diagrams, the processes which have shaped one Irish landform of your choice. [30m]

2008 Question 1B

Examine, with the aid of a labelled diagram or diagrams, the processes that have led to the formation of any one Irish landform of your choice. [30m]

2007 Question 2B

With the aid of a labelled diagram, examine the processes that have led to the formation of any one Irish landform of your choice. [30m]

2006 Question 2B

With the aid of a labelled diagram, examine the processes that have led to the formation of any one Irish landform of your choice – excluding those shown in the above photograph. [30m]
Higher order skills versus recall

The main theme that emerged from coding of answers to open-ended questions was the view that there was a disproportionate amount of assessment of knowledge recall to the detriment of higher order skills (Table 4). In four of the subjects (biology, economics, French and geography), there was concern that recall of facts was being rewarded more than higher order skills and that students may therefore be able to rote learn answers to some of the questions. This could interact with the similarities of exam papers year on year to allow question spotting and the preparation of stock answers.

Table 4. Frequency of comments relating to assessment of knowledge rather than higher order thinking skills

<table>
<thead>
<tr>
<th>Subject</th>
<th>Biology</th>
<th>Economics</th>
<th>English</th>
<th>French*</th>
<th>Geography</th>
<th>Graphics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French*</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphics</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>101</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*There were three subject specialists for French and two in the other subjects, thus a comparable figure for French would be 17.

Some ‘naming’ questions were allocated the same number of marks as ‘explain’ questions in geography, which the subject specialists considered inappropriate. In French, although it was considered that the reading passages were of a demanding standard, students did not always have to read entire passages to find the answers to certain questions and there was a concern about a focus upon receptive (even recognition) rather than productive skills. Command words also tended to reflect lower order (trouve, citez, etc) rather than higher order skills (eg analysez, comparez). The reviewers questioned how students would know that they should respond precisely in some circumstances (eg ‘more than three hours’ rather than ‘three hours’ in one case to attain full marks, when five marks could be gained elsewhere on the question paper with less precision). Further, students were not asked to state things in their own words or explore the main points sufficiently often. Such techniques may have helped to assess higher order skills. Figure 2 shows a French comprehension question. We can see from the marking scheme that students had to identify the right phrase from the short text (note that they are told which section of the text it is in) and doing so would gain five marks.

(ii) Combien de temps Xavier doit-il passer dans le train chaque jour ? (Section 1)

Marking scheme:

**Appropriate direct quotation** OR **correct manipulation acceptable.**

- Plus de trois heures (de transport quotidien)………………………………… 5 Marks
- trois heures (de transport quotidien)……………………………………… 4 Marks

In design and communication graphics and English, there was less concern about the lack of reward for higher order thinking skills. Design and communication graphics examinations assessed higher order skills such as geometrical and numerical procedures. Inference and evaluation were thought to be very much in evidence in English, even if there was a tendency for the focus to be on personal response in Paper 2. Figure 3 gives an example question and an extract from its associated marking scheme from English Paper 2. These questions tended to ask for students’ views and therefore a personal response was indicated as appropriate. Some comments indicated that more engagement with the text itself and its purpose would be beneficial in the English examinations. More variety in questions set in Paper 2 was considered desirable so that students would focus more upon analysis and critical thinking and there would be less rote learning evident in the students’ work.
Syllabus, question paper and mark scheme alignment

In biology, English and geography there was considered to be good alignment between the syllabus and the question papers. Issues relating to the marking schemes are discussed below. The economics and French syllabuses were not very explicit about subject content, which would force teachers to rely to a greater extent upon the question papers to define the taught curriculum. Some economics topics appeared on the question papers even though they were not explicitly on the syllabus (eg the euro, current issues in the Irish context). Syllabus aims were not considered to be completely aligned with the question papers in economics, French and design and communication graphics. In economics, the reviewers felt that assessment of critical thought was not sufficiently evident, whereas in French they felt that there was not enough assessment of stylistic aspects of literary texts, real-life contexts (which were considered to be difficult in an examination in any case), use of different registers, customs and traditions, sexual and racial equality or ethnic minority topics. In the absence of specified weightings for such aspects of language, it is difficult to determine whether this is out of line with the intentions of the syllabus writers, but the subject specialists considered them to be under-emphasised.

The design and communication graphics syllabus had a number of aims that the reviewers considered could not be evidenced clearly in the examination: communication, analysis, evaluation and creativity. This is an area of disagreement between the subject specialists, as the Irish subject specialists considered that these skills were assessed in the project work of this course. The external subject specialists did not believe them to be sufficiently evidenced in the project work because students were given the same design task (rather than creating their own), and did not have to analyse different approaches to design, communicate them in a form suitable for a client and evaluate the ways that they could have approached the design task.

(ii) “The male characters in Friel’s play, Dancing at Lughnasa, deserve our sympathy but not our admiration.”

Do you agree with this view? Support your answer with suitable reference to the text.

Candidates are free to agree and/or disagree with the statement, but they should engage with more than one of the male characters in the play and their response to them (sympathy and admiration). Allow for a broad interpretation of “sympathy” and “admiration”, and that both terms may be dealt with explicitly or implicitly.

Possible points:
- Fr. Jack portrayed as sympathetic/admirable/pathetic/insightful
- a patriarchal world of unreliable/unsympathetic men
- Michael is an engaging/sensitive/detached character
- Gerry Evans – selfish dreamer and/or charming rogue
- looming peripheral figures, such as Danny Bradley and the parish priest Etc.

Note: further guidance on marking is provided elsewhere in the marking scheme
Syllabuses did not contain assessment objectives and the reviewers noted this. Instead, the syllabuses had broader educational aims (eg Figure 4). An example from England (Figure 5) shows how question papers and individual questions are aligned with the assessment objectives and the totality of assessment must achieve predetermined weightings of the assessment objectives. Whether this results in better assessment is questionable, as some examiners complain that it can be an artificial exercise, overly prescriptive, and in some cases a broader statement of what is important in the subject can be more useful than objectives in a list format.

**Figure 4. Irish Leaving Certificate Biology syllabus aims**

The aims of the syllabus are:

- to contribute to students’ general education through their involvement in the process of scientific investigation and the acquisition of biological knowledge and understanding
- to encourage in students an attitude of scientific enquiry, of curiosity and self-discovery through
  - (i) individual and study personal initiative
  - (ii) team work
  - (iii) class-directed work
- to develop an understanding of biological facts and principles
- to enhance an interest in and develop an appreciation of the nature and diversity of organisms
- to create an awareness of the application of biological knowledge to modern society in personal, social, economic, environmental, industrial, agricultural, medical, waste management and other technological contexts
- to develop in students an ability to make informed evaluations about contemporary biological issues

Source: Leaving Certificate Biology syllabus, p2
Connected with concerns over an insufficient emphasis on the assessment of higher order skills, a common factor across biology, economics and geography was that even where higher order command words were used in questions, recall frequently attracted partial credit and occasionally attracted full credit. Points-based, rather than levels-based marking was also noted. Such an approach to marking schemes, if not used carefully, can result in facts rather than analysis and evaluation being awarded credit in the marking schemes, and reviewers saw evidence of this in a number of places. For example, although the biology question in Figure 6 uses the command word ‘explain’, the marking scheme is clearly crediting definitions, which is categorised as knowledge by the SEC Manual for Drafters, Setters and Assistant Setters (Appendix C).
In biology it was considered that section B of the question paper in particular could have offered better opportunities for the assessment of higher order skills. Structuring of this section’s questions (since 2009) had reduced the extended nature of responses. The command word ‘explain’ was often used in the phrase ‘explain the term’, meaning define. One-word answers were sometimes given full credit in these cases. While this was seen as an appropriate part of a biology assessment, subject specialists would have liked to see more ‘explain why’ commands in the questions. Reviews of economics materials were similar, with comments made that lists of facts were common in students’ responses. Again, the meaning of command words differed from the use that the subject specialists were familiar with in terms of the way responses were credited (eg students did not have to ‘discuss’ to be awarded marks on questions with that command word). Some subject specialists questioned whether command words were used interchangeably. For example, although questions 13–24 in geography used the commands ‘examine’, ‘explain’, ‘discuss’ or ‘account for’, the marking scheme appeared to treat these words as though the same kinds of responses were expected from students. ‘Discussion’ was used in the marking scheme for all of the 12 essay questions in 2012. In economics, the lack of requirement for evaluation, data response questions, application of economic models to different contexts, along with a general under-emphasis of the assessment of critical thinking, was commented upon. Writing that was relevant to the topic, unconstrained by the command words and detail of the question was sometimes awarded more credit than was considered appropriate. In geography, there was a lack of synoptic questions and it appeared that some students had reproduced rote-learned answers in the 80-mark questions. Subject specialists saw some evidence of the responses being not entirely targeted to questions and considered that in these instances too much credit was given to students.

Although in design and communication graphics it was considered that higher order skills were rewarded, in the opinions of the subject specialists, low-level work sometimes accumulated high marks. In English, there was a concern that eloquent responses sometimes gained a lot of marks when there was little demonstration of understanding in the student’s examination booklet.

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**Figure 6. Excerpt from the biology 2012 question paper and marking scheme**

<table>
<thead>
<tr>
<th>7. (a)</th>
<th>In relation to the scientific method, explain each of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Data.</td>
</tr>
<tr>
<td>(ii)</td>
<td>Replicates.</td>
</tr>
</tbody>
</table>

**Marking scheme:**

<table>
<thead>
<tr>
<th>7. (a)</th>
<th>Observations or results or other</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>3</td>
</tr>
<tr>
<td>(ii)</td>
<td>Repeats (or copies) of experiment</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

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Transparency of mark schemes

A common finding to every subject investigated was that there was a perceived lack of transparency in the marking schemes. Compared with other examination systems, there were relatively large maximum marks available for question papers and therefore larger maximum marks allocated to individual questions. How individual marks were allocated and whether there was partial credit available was not always evident to the subject specialists. The large maximum marks enable marking to play a role in standard-setting that is unusual in large-scale, high-stakes examinations. Typically, in other examination systems, a separate standard-setting exercise is conducted after marking has been completed.\footnote{Changes in difficulty of the examination are unavoidable unless expensive pre-testing is conducted. A disadvantage of pre-testing is that the security of the examination may be compromised.} The purpose of this exercise is to adjust the cut-scores required for each grade, to adjust for unavoidable changes in difficulty in examinations between years. The Leaving Certificate cut-scores are, however, the same year on year (Table A2, Appendix B). To achieve this, while maintaining standards, the marks allocated to students sometimes require adjustment before the marking scheme is finalised and applied to the work of all candidates. Where examinations have proved to be more difficult than anticipated, more marks are awarded to students than would be for a particular performance, to compensate for the fact that it was more difficult to do so. Conversely, where the examination has proved to be easier, fewer marks would be awarded. In this way, students are rewarded for their knowledge and skills and not for the ease of the particular year’s examination.

The result of this need for flexibility is that the number of marks allocated for the various parts of questions was not always apparent on the question paper, nor was the number of marks that would be gained for different responses always evident in the marking schemes. There is a clear reason for the first of these issues, as the marks for each question part may need to be adjusted during the standard-setting process, and therefore cannot always be decided in advance and printed on the question paper. However, the effect of this is that the amount of work candidates had to do, and the level of response they had to make in answer to questions, was not always clear from question papers or marking schemes. To some extent, teachers and students would have to rely on knowledge gleaned from students’ marked examination booklets in previous years’ examinations. Examples of credit-worthy responses were sometimes given, but overall the marking schemes were not sufficiently transparent to convey, on their own, the way in which marks were credited.

Short-answer questions were sometimes allocated a specific number of marks, but how exactly each mark point was scored was not clear. The rationale for allocation of points was questioned at times by the subject specialists. For example, in the French 2011 Listening question paper (section 4ii), the question was ‘What did she realise at the press conference?’ Three marks were allocated for responses of ‘she was the only woman astronaut in the room’, but only one mark was given for ‘she was the only woman astronaut’. The question paper did not indicate how many marks were available for the question; neither is it clear how students would know how specific they must be in their response to get the full marks available. Elsewhere in the examination, this level of precision was not required in the responses. Figure 7 shows a short-answer question from an economics
examination in which it is unclear how the mark total (17) is sub-divided in the three parts of the question. Which part of the answer would be worth five marks rather than six and why? It is worth considering whether telling the students that there are 17 marks available in total is helpful to them as these marks do not correspond with 17 different points.

**Figure 7. Excerpts from the 2012 economics question paper and marking scheme**

7. Outline three factors currently affecting the rate of savings in the Irish economy.
   (i) __________________________________________________________________________
   (ii) __________________________________________________________________________
   (iii) __________________________________________________________________________
   (17 marks)

Marking scheme:

**Confidence in economy**
People are concerned about the future of the economy which is affecting consumer confidence. As a result people are tending to postpone purchasing and save instead. Consumers are spending less and are deferring spending until later. This results in forced savings.

**Security of savings**
Due to the current economic climate people are less inclined towards risky investments and prefer the security of state backed savings. Due to the on-going banking crisis consumers are seeking greater security for their savings e.g. An Post’s ‘National Solidarity Bond’.

(Real) **Rate of interest**
Savers will seek an interest rate greater than the current rate of inflation so as to maintain purchasing power. If the products available produce reasonable returns / time deposits, then people are more likely to use them as a form of saving.

**Income levels**
For some people income levels have fallen and so they are able to save less.

**Rate of DIRT**
The government increased the rate of DIRT in the December budget. This may discourage some people from saving.

3 points: 6 + 6 + 5 marks.

Where there were optional questions, there were concerns that if this perceived lack of transparency was real to the examining teams during their work, this could lead to a lack of comparability in difficulty between questions. Such unclear marking schemes, in the absence of further information or training, could lead to unreliability in marking, although a sufficiently strong community of marking practice would counteract this to produce more reliable marking.

Teachers can, of course, look at how marks were credited on the students’ booklets. Markers are given training and can discuss the marking with each other. There is also monitoring of their marking and advice is given. These are common features of examining systems that help to convey the meaning of the marking schemes beyond the written text.
Likely effects on the taught curriculum

One possible effect of problematically predictable examinations is that the taught curriculum may be narrowed, as teachers and students can topic spot and avoid teaching and learning areas of the subject. Two of the subject groups did not detect likely problems with this, but in four subjects this was considered to be a risk, for different reasons. In biology and geography, it was considered unlikely that the examination would lead to narrowing of the taught curriculum. However, in economics and English it was thought that there would be a large temptation to specialise. Certain topics came up frequently in economics. In English, a teacher could produce strategies that would save a lot of work in preparing for the examination (eg when studying the poetry of Plath, one could pick three Plath poems in advance that would be students’ ‘favourites’ in the examination, rather than study the wider range of her poetry as envisaged). In French, the degree of choice meant that students could avoid some topics altogether. The syllabus content was thought to be broad and demanding in design and communication graphics, but the examinations allowed a focus upon narrower aspects of the syllabus. For example, the syllabus states that students should demonstrate the ‘ability to evaluate technological activities, artefacts and systems critically and constructively’, but subject specialists did not consider that this was required to the extent that they expected in the examination and project. There were a number of such mismatches between the text of the syllabus and the assessments in the view of the subject specialists.

Additional subject-specific findings

Biology

The subject specialists were positive about the fact that practical questions always featured on the examination, and hoped that this would influence teaching, such that students would be required to do practical work in class. They also felt that some recall in biology is good preparation for future study for professions such as medicine. Overall, the consensus was that biology was neither predictable nor unpredictable. One subject specialist summarised the issues as follows.

In terms of the structure of the paper, the question types, the types of resource material, the level of difficulty and the skills assessed, I think students who have looked at papers from previous years will know exactly what to expect. However, crucially, in terms of the content covered by the exam paper, since each paper covers such a wide variety of topics, there is no discernible pattern to the questions and it would not be easy to predict what was likely to come up.

Command words were not always obvious in section C, where they were embedded in lengthy text. Here, it was considered that more transparency would be helpful to indicate to students what is expected of them.

The biologists noted that the examination paper resources were old fashioned, with sketchy diagrams and no colour or photographs (eg Figure 8). While this is not directly related to predictability, it is in keeping with views that the examinations have not changed over time. Not only

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8 Note that this contrasts with the comments on the resources for the geography examination.
might modernising the resources add to the quality of the assessment, the backwash upon teaching and learning might be positive. Furthermore, perceptions of predictability can be damaging for the credibility of an examination, even if they are not based in fact. Thus, perception management is worthwhile in itself. The processes referred to in the content of the examination papers were seen to be cutting edge, so it is unfortunate that the resources detracted from this. This, together with what the reviewers considered to be an undue emphasis upon rewarding factual recall, made the examination materials look dated in their approach.

**Figure 8. Excerpt from the 2010 biology question paper**

![Diagram of a virus attached to a host cell](image)

(a) (i) What is part A made of? .................................................................
(ii) What is part B made of? .................................................................

**Economics**

The economics specialists came to a consensus that overall economics is *quite* (not very) **problematically predictable** across the ten years. The surface features of the examination were helpfully predictable and the content of questions varied, at least in part. For example, elasticity was a common topic, but the ways in which it was assessed were considered to be unpredictable.

The subject specialists liked the broad range of material covered in the exam and the fact that teachers would be likely to teach some topics very thoroughly as they would definitely come up. They also felt that the layout, formats and wording were beneficially predictable. The demand to learn about major economists was thought to be good, as it would open up the possibility of doing independent research and gaining a deeper understanding of the subject. More extended writing would have helped to assess issues such as application of economics ideas to different problems.

**English**

No consensus was reached on the level of problematic predictability of the English examinations. Comments were made that the nature of the skills required was predictable and that certain themes or ‘characters’ would come up repeatedly in the literature examination. However, the nature of the skills required in English meant that one of the subject experts felt that there would always be a degree of unpredictability. The thematic approach to question papers was also considered beneficial in reducing the level of predictability.
The subject specialists did not think it was a problem that some of the skills are predictable, but saw it as positive because students should develop these skills in preparation. They liked the reassuring pattern to the exams that would prevent students from becoming fazed by the layout etc. The papers required candidates to develop skills in preparation for the assessment. There was a good focus on poetry: poets studied in class as well as unseen poems came up every year. They were also impressed by the comparative section in Paper 2, while feeling it was hard to select the right texts and questions for this year on year and much of it was directed towards character or theme.

Although the marking scheme indicated that students were given credit for the following features of their writing, the subject specialists judged that the application of this process was unclear from the evidence that they scrutinised: clarity of purpose (30%), coherence of delivery (30%), efficiency of language use (30%) and accuracy of mechanics (10%).

French

The French specialists came to a consensus that the examinations were quite (not very) problematically predictable. Students’ responses showed evidence of prelearnt idiomatic phrases without a clear understanding of their meaning. Students could at least partially succeed in the examination by being able to recognise a smattering of phrases without necessarily understanding the majority of the text. More open-ended questions would have helped to assess higher order skills and productive abilities.

Cultural awareness, in terms of requirement for comparisons of Irish and French lifestyles, was thought to be a positive feature of the examinations. Additionally, the requirement for personal engagement on topics that students could relate to (such as their personal opinions, own lives, self-reflection, etc) was seen as positive. However, more engaging stimulus material was thought to be needed. Due to what they regarded as an undue emphasis upon lower level skills, subject specialists considered that there was not a great deal of distinction in performances between the students who scored highly and others. Also, the logic of awarding marks was not always evident, as previously discussed.

In the written production section, question 2 essentially included the same question between 2003 and 2012 (‘Qu’est-ce que vous notez à ce sujet dans votre journal intime?’). The writing required of students would have differed, due to the different subject matters, but candidates and teachers will naturally anticipate that this question will come up in the examination. This shows the complexity of the issue of predictability. An identical question, if targeted at sufficiently different subject matter, can offer helpful predictability. If the response required is too predictably similar each year, then this could be problematically predictable. In this case, the question required different enough responses from students year on year, but the use of an identical question annually could give the broader public and the media the wrong impression.

The range of vocabulary used in the aural examination was thought to be a positive feature of the examination. The content of the speech was not always authentic (eg a radio broadcast), but this was considered difficult to do for an examination. Questions in the aural tended to be factual. Students were asked questions and answered in English, which, while appropriately keeping the focus of the task on the intended receptive skills, made the task less demanding.
Students appeared to be well prepared for the oral examination and there was a standard approach to most of the questioning; a first question of ‘Quel âge avez vous?’ was common. Searching questions were uncommon in the oral examinations, with follow-up questions for explanations not heard in any of the work scrutinised. There was no discussion of cultural or literary topics in the examples heard and superficial, short topics were included. For example, when a student was asked about differences between the US and Ireland, she responded that the weather was fine in the US, but it rained in Ireland. As such, the subject specialists concluded that the oral examination did not involve challenging questions, was a little formulaic and there seemed to be a set pattern relating to tenses in the questioning that students may well have expected.

**Geography**

The geography specialists came to a consensus that overall geography is **neither problematically predictable nor unpredictable** across the ten years. The elective questions appeared to be less predictable, but cultural identity and biomes came up frequently. Soils was a topic that students might be able to avoid. Resource materials in geography were described as stunning, but it was considered that there was more scope to extend the questions based upon them. The teaching materials were thought to be a great resource for teachers, supporting lesson plans in blocks of content with helpful examples.

**Design and communication graphics**

The design and communication graphics specialists came to a consensus that overall design and communication graphics is **quite (not very) problematically predictable**. Similar questions, requiring similar processes, were noted in the question papers across years. For example, questions A-1 and A-3 in the 2010 and 2011 question papers respectively, required students to carry out what the subject specialists considered to be very similar procedures and the marking schemes also indicate this (Figure 9).

Although the skills tested were considered to be higher order skills of numerical and graphical thinking, the specialists noted that these could be rote learned. There was concern that the syllabus could foster drilling of students and that terminal component of the examination did not allow students the opportunity to be creative, solve problems and engage with the analysis of materials etc that would be required of them in a vocational setting. The skills required in the terminal component examination were thought to focus upon those of technical drawing, rather than more broadly design and communication graphics. Although going back to the first principles of technical drawing had some advantages, there was a worry that the skills being taught for this examination would not be suitable for the modern workplace in which computers are used to do much of the calculations and drawing.

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9 In relation to this example, readers should note that the technique required for finding the shortest distance between two skew lines (A-1, 2010) is not the same as that required to find the shortest horizontal distance between them (A3, 2011), and that only the first step is common to the two solutions. The reviewers’ comment is therefore that these are generally similar kinds of tasks, rather than that they are exactly the same task.
Figure 9. Excerpts from the 2010 and 2011 design and communication graphics question paper and marking scheme

2010

A-1. The flight paths of two aircraft are represented by the two skew lines AB and CD.

(a) Determine the projections of the shortest distance between the two lines.

(b) Determine and indicate the length of this shortest distance.

2011

A-3. The graphic below shows a number of sloping arms which support lights in a modern sculpture.

Two such arms are represented by the skew lines AB and CD on the right. Determine the projections of the shortest horizontal distance between the two lines.
2010 Mark scheme:

**QUESTION A-1**

(a) **Projections of shortest distance (17)**

(i) Creating a plane containing AB (or CD) and parallel to CD (or AB) ....................4

(ii) Finding edge view of plane... (1, 1, 2) ....................................................4

(iii) \(X_2Y_2\) parallel to skew lines ..................................................................3

(iv) Identification of shortest distance in 2\(^{nd}\) aux ......................................3

(v) Draw req. projections (projecting or measuring to plan and elevation) ..........3

(b) **Length of shortest distance (3)**

(vi) Correct length of shortest distance indicated .............................................3

**Total = 20**

2011 Mark scheme:

**QUESTION A-3**

**Projections of shortest horizontal distance**

(i) Creating a plane containing AB (or CD) and parallel to CD (or AB) .....................4

(ii) Elevation and plan of horizontal line on parallel plane...(1,2)..........................3

(iii) \(X_1Y_1\) perpendicular to plan of horizontal line ...........................................2

(iv) Projections of lines in 1\(^{st}\) auxiliary elevation ... (parallel) ...... (1,1,1).........3

(v) \(X_2Y_2\) perpendicular to \(X_1Y_1\) .................................................................2

(vi) Identification of shortest horizontal distance in 2\(^{nd}\) auxiliary ... (1,1) .................2

(vii) Draw req. projections (projecting or measuring to plan and elevation)....(1,1,1,1) ......4

**Total = 20**

The subject specialists approved of the fact that the exam required students to learn about the skills of construction, precision, spatial thinking, abstract thinking, technical terms and the application of techniques.

The subject specialists were subsequently reconvened to review the other component of the examination – the student assignment. Use of CAD (computer-aided design) in the projects was evident. Projects were thematic annually, rather than allowing students to choose particular design
projects creatively and take risks in so doing. Students appeared to be handling the CAD well, which was considered impressive. There appeared to have been good teaching in support of the projects and the use of CAD had its challenges. However, it was noted that use of CAD was process based, rather than CAD being seen as a tool with which to explore and present different design options, for example to a client. The presentation of projects was very clear, but it was at times apparent that students were cutting and pasting information from the internet rather than making the points relevant to the task. There was a lack of depth to some of the work with lower marks and it appeared simplistic. For example, where measurements were produced by the CAD drawings, they were sometimes unrealistic. Even the high-scoring projects did not compare and contrast design options. Many students presented the options for the reader to compare, but this was not supported by their own analyses. Reflection was evident in the work, and credited in the marking scheme, but it was a personal reflection (eg enjoyment) rather than reflection on the design process and decisions. In 2013, students were designing a lectern. They did not consider issues of different materials that could be used and their advantages and drawbacks. Neither did they consider anthropometric or ergonomic features of the design. Where materials were mentioned (eg plastic or metal), there was no consideration given regarding different types and their appropriateness for the object. Although CAD was used to show cross sections etc, there was no discussion of the design sub-systems: how the components fit together, how they move and why.

Irish subject specialist commentaries

Detailed commentaries were given by the Irish subject specialists, in response to a draft of this working paper. Factual accuracies were investigated and discrepant views were discussed with the subject specialists involved in the research. Notwithstanding, there will be findings presented in this report that remain contentious. Of the six subjects, strongest disagreement was found for DCG. The Irish subject specialists indicated that the main focus of the syllabus was intended to be graphics (technical drawing and the use of CAD), whereas the subject specialists involved in the research had read the design and communication aspects of the syllabus to be under-emphasised. It is thus questionable whether the intended curriculum incorporated, for example, the communication of design decisions relating to different materials. Syllabus and question papers cannot convey all of these intentions on their own. Certainly, as the syllabus stands, the approach taken by the subject specialists involved in this research can be seen as legitimate. However, if the Irish subject specialists, teachers and students have a shared understanding of the intended curriculum and are content with it, then this alternative view of the subject might not lead to changes for the Leaving Certificate. Although the DCG syllabus was revised relatively recently, in the light of these opposing views, it would be advisable to investigate whether there is anything that can be gleaned from approaches to examining related subjects elsewhere that could beneficially incorporate more design and communication aspects into what is essentially a graphics syllabus.
Conclusions

**Research question 2 – what kinds of learning are the examinations intended to promote?**

Higher order thinking skills of application and understanding were included as aims of all syllabuses and evaluation was mentioned in a number of them, although the weightings to be given to these skills were not specified. Evaluating the alignment between the syllabuses, question papers and marking schemes was therefore problematical. Nonetheless, the reviewers considered that the marking schemes did not clearly credit higher order thinking skills to the extent that they considered appropriate, and they also judged that questions did not always target the desired kinds of learning.

Over the past two decades, assessment practices in many countries have generally become more transparent and have emphasised higher order thinking skills to a larger extent. Comments were made about the syllabus and examination materials being old fashioned in terms of syllabus content (economics, French, design and communication graphics), skills assessed (biology, economics, geography, design and communication graphics), design of marking schemes (all subjects) and presentation of question paper resource materials (biology). Frequent changes can be disruptive to an education system, but in the extreme case of economics, the syllabus had not been revised since 1969. We recommend that consideration is given to revising the syllabus and examination materials more frequently, and trends in other assessments internationally should be reviewed as part of the process.

**Research question 3 – how predictable are examination questions in the Leaving Certificate in Ireland?**

Curriculum-embedded examinations are intended to have elements of predictability in their design, so that they test validly the intended curriculum. Questions should not catch students out, preventing them from showing what they know and can do. Layout of question papers and the format of questions were beneficially predictable in all of the subjects investigated.

The topic matter of questions was either ‘quite different’ or ‘quite similar’ for all of the subjects studied, while the skills required were either quite or very similar, year on year. These findings are also positive and taken together indicate that predictability was not, in itself, a big issue for these subjects. Indeed, the subject specialists concluded that biology, English and geography were not problematically predictable overall.

Deeper issues relating to the kinds of skills required were identified in DCG, economics, and French. These subjects were judged as quite (not very) problematically predictable overall by the subject specialists. For each subject the issues were different. The DCG examination was thought to contain similar questions annually and to focus upon technical drawing rather than graphics and communication. While the questions required higher order skills, their recurrent nature could lead to learning procedures by rote. In economics, although the focus upon theory was viewed positively, it was considered that the requirement for critical evaluation could have been greater. This would have meant that pre-prepared responses would have been less likely to be produced (or be less
credit worthy) in the examination. In French, the subject specialists considered that there could have been more emphasis upon extended response and demonstration of understanding.

Requirements for higher order skills are generally thought to make examinations more demanding. However, breadth as well as depth affects demands. With between six and eight subjects typically being taken for the Leaving Certificate, the curriculum is broad in Ireland compared with some other countries. At the secondary level, this is a strong feature of the system. Changes to the examination must therefore be handled with a view across the curriculum to ensure that the demands upon students are realistic. With the exception of DCG, it was considered that small changes to all of the subjects could have positive effects upon teaching and learning.

Irish subject specialists did not always agree with the conclusions in this report. Whether an examination has struck the right balance in terms of predictability and assessment of higher order skills will not necessarily be seen the same way by all subject specialists. There are tensions within subjects about curriculum and assessment emphases. Additionally, this research was not limited to the questions of compliance with regulations or even curricula. The research questions allowed us to give a view of whether the examinations were appropriately predictable. DCG provoked particular dissension between specialists, with the Irish specialists seeing the subject as modern and having good curriculum alignment. The external subject specialists focused upon the design and communication aspects of the title to a larger extent and considered that there was too much graphics in the examination and too little of the other title words. These represent different views of the syllabus and subject.

In a later phase of this research programme, we investigate teachers’ and students’ views of predictability, to give other important views on the issues.

**Research question 4 – which aspects of this predictability are helpful and which engender unwanted approaches to learning?**

Beneficial aspects of predictability were evident in all subjects, as the question format and layout of the examinations were consistent. This is helpful in allowing students to prepare for the examinations and demonstrate their knowledge without being distracted by surface features of the questions.

With the exception of the English examination, there was concern that evaluation, analysis and higher order thinking skills in general were under-emphasised in the question papers and marking schemes. When an examination tests factual knowledge to the detriment of higher order skills, there is a possible negative effect on learning associated with the temptation to try to guess the question topics. When higher order skills are emphasised more, this kind of preparation is less useful and therefore less likely to occur.

**Research question 5 – what are the syllabus and assessment design phenomena associated with predictability?**

Test conditions, question and performance formats and the availability of examination support materials (eg past papers, marking schemes and students’ marked booklets) contribute to predictability in positive ways.
In part due to the use of fixed cut-scores for grades, marking schemes were not very transparent. Given that an appropriate distribution of marks must result from the process, it is not entirely possible to specify the marking in advance. The marking scheme must, at times, be altered to produce an appropriate mark distribution. This is a fundamental issue for the system in moving away from problematical predictability associated with the accreditation of points for factual information. Adjusting the marking distribution by altering the marking scheme is more manageable if the changes relate to factual issues. More subtle judgements regarding higher order skills would be more difficult to revise in a reliable manner at a time when the examination system is under a great deal of time pressure and the expectations for marking reliability are high. Without the constraint of fixed cut-scores, it may be more straightforward to achieve a better balance between the assessment of knowledge and higher order thinking skills.

In terms of syllabus design, there were large differences between subjects. In part, this might relate to the length of time since the syllabus was last revised. The economics syllabus had not been revised since 1969 and it was therefore very under-specified. This meant that the examination had to play a major role in signifying the curriculum. Introducing many surprises in the examination would be very unfair to students under this circumstance, even if changes were a good signal to future years’ students about what they should study. None of the syllabuses struck the subject specialists as especially modern, in large part due to their under-emphasis of higher order thinking skills. Over the past few decades, there has been an international trend in syllabus design towards assessing more higher order thinking skills in public examinations, being transparent about this intention in the syllabus and reflecting this in a breakdown of syllabus aims and objectives – even weighting aims and objectives in a clearly laid out section of the syllabus.

A more frequent syllabus revision programme would ensure that the Leaving Certificate could incorporate advances in assessment and curriculum design, including avoiding a situation in which the examinations become the main signal of the intended curriculum content.

**Research question 6 – what subject-specific phenomena are associated with predictability?**

Half of the subjects were not seen as problematically predictable overall, but we include subject-specific comments from the subject specialists for all six subjects in Table 5. Note that many positive features of the subjects were given in this report and here we summarise some issues for consideration that may improve the assessments.
Table 5. Subject-specific problematical predictability

<table>
<thead>
<tr>
<th>Subject</th>
<th>Predictable overall?</th>
<th>Comments for improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>No</td>
<td>A greater focus upon development of scientific thinking, reasoning and creativity, rather than recipes for scientific methods would improve the assessments.</td>
</tr>
<tr>
<td>Economics</td>
<td>Yes</td>
<td>Positive focus upon theory and evidence of real-world application, but more encouragement of critical engagement would be beneficial.</td>
</tr>
<tr>
<td>English</td>
<td>No</td>
<td>Deeper engagement with the purposes of the source text and language specific to genres and texts would be beneficial. Uniform learning outcomes lead to a lack of focus and a lack of variety of responses, with too many being personal responses.</td>
</tr>
<tr>
<td>French</td>
<td>Yes</td>
<td>More emphasis upon understanding and extended writing in students’ own words would be beneficial.</td>
</tr>
<tr>
<td>Geography</td>
<td>No</td>
<td>Some topics came up frequently and this could be addressed.</td>
</tr>
<tr>
<td>DCG</td>
<td>Yes</td>
<td>More focus upon graphics and communication and less upon technical drawing would be beneficial. Varying the questions more would reduce predictability.</td>
</tr>
</tbody>
</table>

Limitations

The research is limited in a number of ways. Not all subjects were investigated and there were a small number of reviewers. Subject specialists were familiar with a range of examination types, but were most familiar with English A-level and GCSE examinations and this could have affected their judgments. Students at A-level have chosen to specialise in the subject areas concerned, and generally consist of a sector of the age cohort with aspirations and expectations to study those subjects or related ones at university. The Leaving Certificate programme, on the other hand, is more broadly based and is intended to meet the needs of the entire age cohort; students typically study about seven subjects, including ones that they may not have a particular interest in or aptitude for. The structure of the Irish Leaving Certificate was introduced at the workshop and there were discussions throughout the day regarding the differences between the systems and the fact that content standards were not the focus of the research.

Additionally, although independent research has strengths of judgments not being coloured by the prevailing views, it could be limited by lack of understanding of the context. To mitigate the latter limitation, subject specialists who understand the Irish Leaving Certificate very well were asked to comment on a draft of this report. Examination and assessment managers from SEC, subject officers from NCCA and subject inspectors from the Department of Education and Skills were asked for their comments. It is noted that Irish specialists did not always share the views of the external specialists, and in some cases there was a significant divergence of views.

This research is part of a wider research programme in which students’ and teachers’ views on the predictability of the Leaving Certificate examinations will also be investigated. As such, it is possible that other views on this issue could contradict these findings.
Appendix A: Subject Specialists

**Roy Bowden** is the Chair of Examiners in GCE Economics for the Assessment and Qualifications Alliance (AQA). He has 25 years of examining experience, with past positions at Edexcel and as Reviser, Principal Examiner, and subsequently Chief Examiner in Economics at AQA prior to his appointment as Chair in 2012.

**Quintin Brewer** is a Chief Examiner in GCE Economics for Pearson Edexcel. He has 30 years of experience in examining and has previously been a Principal Examiner in Economics.

**Dan Cowling** is an experienced examiner in Geography for Pearson Edexcel and has been examining since 1999. He is a Chartered Geographer, textbook author and an active member of the Geographical Association, and also Head of Sixth Form at Orleans Park School in Twickenham.

**Jacqueline Gray** is a Principal Examiner in Biology for the Council for the Curriculum, Examinations & Assessment (CCEA). She has been examining for over ten years.

**Steve Harrison** is a Principal Examiner in GCSE and A-Level French for the Assessment and Qualifications Alliance (AQA) and has been examining for over 20 years.

**Richard Hoyes** is a Chief Examiner in English Literature for Pearson Edexcel, and has been examining English Literature since the 1970s.

**Mary Jay** is a Chief Examiner in English Language and Literature for Pearson Edexcel. She is also Team Leader for the English Language and Literature International Baccalaureate (IB) and mentor for new examiners, and has been examining since the mid-1970s. She has also been a tutor in sixth-form colleges for English Literature, English Language and English Language and Literature at A level.

**Malcolm Johnson** is a Chief Examiner in French for Pearson Edexcel. He became Chief Examiner of GCE French for Edexcel in 1989 and has been examining since 1975.

**Dr Jane McNicholl** is a Lecturer in Education at Oxford University, specialising in the teaching of science at the secondary level.

**Robert Miller** is Chair of Examiners for the Pearson Edexcel suite of GCSE D&T subjects (Graphic Products, Resistant Materials, Textiles Technology, Food Technology, and Electronic Products) and, also for Pearson Edexcel, a Principal Moderator for GCE Product Design and Chief Examiner in Applied Engineering.

**John Smith** is a Principal Examiner in A-Level Geography for the Assessment and Qualifications Alliance (AQA). He is also Chief Examiner for the Leisure Studies vocational A-Level and Chair of Examiners for the Diploma in Travel and Tourism. He has over 30 years of prior experience in examining and moderating coursework at CSE, GCSE and A-Level.

**Stephen Turner** is a Chief Examiner in Graphics for Pearson Edexcel. He has been examining for 25 years and has previously held positions at the Assessment and Qualifications Alliance (AQA) and Oxford, Cambridge and RSA Examinations (OCR). He has taught Design Technology at all levels for 30 years and is presently Head of Technology at a comprehensive school in Lincolnshire.

**Eileen Velarde** is the Chair of Examiners in French for the Assessment and Qualifications Alliance (AQA). She has been examining for 35 years and was previously the Chair and Chief Examiner for the Northern Examinations and Assessment Board (NEAB) and for the Joint Matriculation Board (JMB).
Appendix B: Post-Primary Education and the Irish Leaving Certificate

Post-primary education in Ireland consists of two cycles: a compulsory three-year junior cycle culminating in the Junior Certificate examination, and a two-year non-compulsory senior cycle. One transition year can be taken between the Junior and Senior cycles, and students have a choice between three senior cycle programmes each leading to a state examination (see Figure A1).

![Figure A1. Post-primary education in Ireland](image)

The majority of Irish students will take the traditional Irish Leaving Certificate Programme in which they have course choices (usually six to eight courses are selected) from over 30 syllabuses, and must study a minimum of five Leaving Certificate subjects of which one must be Irish. Matriculation requirements for universities and other third-level institutions are such that almost all students also take English and mathematics, and the vast majority take a third language. Table A1 displays 34 course choices currently listed on the Irish National Council for Curriculum and Assessment website. Students also have the option of two other senior programmes: the Leaving Certificate Vocational Programme (LCVP), where there is a concentration on technical subjects, and the Leaving Certificate Applied (LCA), which is a self-contained programme centred on the individual student’s needs in a cross-curricular (as opposed to subject-based) approach and is for students not catered to by the other two senior programmes.

Most subjects offer paper examinations at two levels, ordinary and higher, with the exceptions of maths and Irish which have the additional level of Foundation. Some subject examinations are additionally assessed with oral and aural examinations (Irish, French, German, Italian, Spanish,
Russian and Japanese), practical examinations (engineering, construction studies, art and music), and the assessment of practical coursework (engineering, construction studies, agricultural economics, agricultural science, home economics).

Table A1. Irish National Council for Curriculum and Assessment course list

<table>
<thead>
<tr>
<th>Subject</th>
<th>First year of examination of current syllabus</th>
<th>First year of examination of current syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish</td>
<td>2012</td>
<td>Physics</td>
</tr>
<tr>
<td>English</td>
<td>2001</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2013</td>
<td>Biology</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>1975</td>
<td>Physics and Chemistry</td>
</tr>
<tr>
<td>French</td>
<td>1997</td>
<td>Agricultural Science</td>
</tr>
<tr>
<td>German</td>
<td>1997</td>
<td>Home Economics</td>
</tr>
<tr>
<td>Spanish</td>
<td>1997</td>
<td>Business</td>
</tr>
<tr>
<td>Italian</td>
<td>1997</td>
<td>Accounting</td>
</tr>
<tr>
<td>Russian</td>
<td>2003</td>
<td>Economics</td>
</tr>
<tr>
<td>Japanese</td>
<td>2004</td>
<td>Art</td>
</tr>
<tr>
<td>Arabic</td>
<td>2004</td>
<td>Music</td>
</tr>
<tr>
<td>Latin</td>
<td>&lt;1980</td>
<td>Religious Education</td>
</tr>
<tr>
<td>Ancient Greek</td>
<td>&lt;1990</td>
<td>Construction Studies</td>
</tr>
<tr>
<td>Classical Studies</td>
<td>1985</td>
<td>Engineering</td>
</tr>
<tr>
<td>Hebrew Studies</td>
<td>&lt;1990</td>
<td>Design and Communication Graphics</td>
</tr>
<tr>
<td>History</td>
<td>2006</td>
<td>Technology</td>
</tr>
<tr>
<td>Geography</td>
<td>2006</td>
<td>Agricultural Economics</td>
</tr>
</tbody>
</table>

Notes:
Candidates may not take any of the following subject combinations:
1. Physics and Chemistry and either of the separate subjects, Physics or Chemistry.
2. Economics and Agricultural Economics.
The syllabus (specification) for each subject, including the assessment specification, is drafted by the National Council for Curriculum and Assessment and approved by the Department of Education and Skills. The examinations on these syllabuses are then implemented by the State Examinations Commission.

At each level, results are issued as grades. The grade boundaries (cut-scores) are fixed in advance and are the same for all subjects and levels. Table A2 shows this grading scale.

**Table A2. Grading scale for senior examinations**

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 or over</td>
<td>A1</td>
</tr>
<tr>
<td>85 but less than 90</td>
<td>A2</td>
</tr>
<tr>
<td>80 but less than 85</td>
<td>B1</td>
</tr>
<tr>
<td>75 but less than 80</td>
<td>B2</td>
</tr>
<tr>
<td>70 but less than 75</td>
<td>B3</td>
</tr>
<tr>
<td>65 but less than 70</td>
<td>C1</td>
</tr>
<tr>
<td>60 but less than 65</td>
<td>C2</td>
</tr>
<tr>
<td>55 but less than 60</td>
<td>C3</td>
</tr>
<tr>
<td>50 but less than 55</td>
<td>D1</td>
</tr>
<tr>
<td>45 but less than 50</td>
<td>D2</td>
</tr>
<tr>
<td>40 but less than 45</td>
<td>D3</td>
</tr>
<tr>
<td>25 but less than 40</td>
<td>E</td>
</tr>
<tr>
<td>10 but less than 25</td>
<td>F</td>
</tr>
<tr>
<td>Less than 10</td>
<td>No Grade</td>
</tr>
</tbody>
</table>

Source: State Examinations Commission

The universities and other higher education institutions collaborate to implement a common entry procedure administered by a company that they have established for this purpose, the Central Applications Office (CAO). Subject to meeting certain course-specific basic entry requirements, places on most courses are allocated solely on the basis of a composite score based on Leaving Certificate grades. For each level (foundation, ordinary and higher) and grade (A1 to No grade) points are awarded to the applicant. Points may be accumulated on up to six examination results. Table A3 displays the grade to point conversion table and Table A4 displays an example of point accumulation for an Irish student. Most students will take the Irish Leaving Certificate examinations between the ages of 17 and 18 after having completed five to six years of post-primary education.
### Table A3. Grade to point conversion table

<table>
<thead>
<tr>
<th>Leaving Cert Grade</th>
<th>Higher Paper</th>
<th>Lower Paper</th>
<th>Maths Foundation #</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>100</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>A2</td>
<td>90</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>B1</td>
<td>85</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>B2</td>
<td>80</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>B3</td>
<td>75</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>70</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>65</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>60</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>55</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>50</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>45</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Note: Students writing the Higher Level Maths exam are now awarded 25 additional points.

Note: Irish can also be written at the Foundation Level.

Source: Irish Central Applications Office

### Table A4. Example of a student point calculation table

<table>
<thead>
<tr>
<th>Subject</th>
<th>Level</th>
<th>Grade</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish</td>
<td>Higher</td>
<td>C2</td>
<td>65</td>
</tr>
<tr>
<td>English</td>
<td>Ordinary</td>
<td>A1</td>
<td>60</td>
</tr>
<tr>
<td>Maths</td>
<td>Higher</td>
<td>D2</td>
<td>50+25=75</td>
</tr>
<tr>
<td>French</td>
<td>Higher</td>
<td>B2</td>
<td>80</td>
</tr>
<tr>
<td>Biology</td>
<td>Higher</td>
<td>C1</td>
<td>70</td>
</tr>
<tr>
<td>Geography</td>
<td>Ordinary</td>
<td>A1</td>
<td>60</td>
</tr>
<tr>
<td>History</td>
<td>Higher</td>
<td>B3</td>
<td>75</td>
</tr>
</tbody>
</table>

Add the best six scores, shown in **bold**

Points = 425

Source: Irish Central Applications Office
References


## Appendix C: SEC Manual for Drafters, Setters and Assistant Setters

### Appendix 5: Question Cues and Bloom’s Taxonomy (Cognitive Domain)

<table>
<thead>
<tr>
<th>Level</th>
<th>Learner Ability/Action</th>
<th>Typical Command Words</th>
<th>Typical Question Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong> (recall and recognition)</td>
<td>Simple recall of previously learned material.</td>
<td>List, Define, Label, Identify/Name, Draw</td>
<td>Which one? What is the best one? Who, what, when, where, how? How much? What does it mean?</td>
</tr>
<tr>
<td><strong>Comprehension</strong> (translating, interpreting, and explaining)</td>
<td>Ability to make sense of the material.</td>
<td>Describe, Demonstrate, Identify, Paraphrase, Report, Discuss, Interpret</td>
<td>State in your own words. Give an example. What seems to be? Which statements support? Is this the same as? Explain what is happening. How do you think he meant when he said? Show in a graph/table. What part doesn’t fit? Select the best definition. Which is the odd one out?</td>
</tr>
<tr>
<td><strong>Application</strong> (in situations that are new to, or have a new slant for students)</td>
<td>Ability to use learned material in a new situation with a minimum amount of help or direction.</td>
<td>Apply/Use, Demonstrate, Calculate/Compute, Elaborate, Solve</td>
<td>Predict what would happen if. What would result? Identify the results of. According to our definition of…, which of the following would be considered to be? How is it an example of? How much change would there be? Why is… significant? Judge the effects.</td>
</tr>
<tr>
<td><strong>Analysis</strong> (breaking down into parts, forms)</td>
<td>Break material into components parts so that its structure may be understood. Break complex concepts down to component parts and analyze how parts are related to each other; sorting patterns, recognizing hidden meanings.</td>
<td>Analyze, Compare/Contrast, Separate, Order/Classify, Explain, Characterize</td>
<td>Develop, Distinguish, Examine, Outline, Definitive, Deduce</td>
</tr>
<tr>
<td><strong>Synthesis</strong> (combining elements into a pattern not clearly there before)</td>
<td>Put parts together to form a new whole; may be in verbal form or a physical object.</td>
<td>Combine, Modify, Rearrange, What if? Generalize, Compose, Construct</td>
<td>Create, Design/Plan, Develop, Propose, Formulate, Make</td>
</tr>
<tr>
<td><strong>Evaluation</strong> (according to some set of criteria, and state why)</td>
<td>Assess to judge the value of material based on certain criteria. Evaluate, make judgments on the worth of a concept for a purpose, resolve controversies/differences of opinion…verify value of evidence; recognize authenticity.</td>
<td>Argue, Convince, Conclude, Justify, Support, Predict, Prove, Select/Choose</td>
<td>Which is more important, moral, logical, valid, appropriate? What difficulties, controversies, inconsistencies appear. Find the errors.</td>
</tr>
</tbody>
</table>

Appendix C: Data Collection Instrument

Predictability Project – Examination materials analysis

Thank you very much for taking part in our analysis of examination materials. This is a really important and interesting topic and we hope you enjoy the process. We are asking you to conduct an analysis of the Higher Level Irish Leaving Certificate in your subject area and to write a structured report on your findings. We will then meet to discuss the findings in this subject and across the six subjects included in the study (biology, design and technology: graphics, economics, English, French, geography) at the workshop in Oxford on 9th July.

The procedure we would like you to use is outlined in detail below. It involves a first reading through of all of the materials, followed by a rating exercise. There are then some more open-ended questions that we would like you to answer at the end. Please complete all your answers on computer, as typed responses, and return them to us by email. This will help us a lot with our analysis of your comments. If you have any queries about the process please contact us by email at any time.

With this message you should find the following additional attachments:

- A flyer outlining the project overall
- An outline of the Secondary Leaving Certificate
- A syllabus
- A teacher’s guide
- Appendix 5 on command words from the SEC publication *A Manual for Drafters, Setters & Assistant Setters*
- Higher level examination papers from 2003–2012
- Higher level marking schemes from 2003–2012
- Students’ responses to the Higher level 2012 examination
  - 5 scripts at each of grades A, C, D and E, giving a total of 20
  - there are no grade E scripts in geography, giving a total of 15
  - only 4 grade E scripts in French, giving a total of 19

Please could you email your responses by Monday 1st July? We look forward to meeting you and discussing findings on 9th July in Oxford.

Data Collection

Stage 1:

Please start by familiarising yourself with the syllabus document by reading it through carefully.

Then please read *all* of the Question Papers, with Mark Schemes alongside, for your subject. You can read these in any order you like. The idea is to get a sense of what the papers are like so you will form an overall impression without making any notes at this stage.

You also have a selection of scripts from the 2012 Leaving Certificate covering a range of grades. Use these in any way you like, in order to get a picture of the kinds of responses students gave to the 2012 question papers, and make a note of anything you see that you think might be relevant to this project.
**Stage 2:**
Pick out a pair of consecutive years of Question Papers and Mark Schemes and look through them more closely.

**Stage 3:**
Now make ratings below. For each pair make a rating on each dimension (e.g. content, skills, etc.) before moving on to the next pair and starting again from Stage 2 above.

*During* the rating of a pair please make as many notes as you like. **Comments on why you are giving a particular rating will be very helpful to us.** However, don’t feel you have to comment on every single rating – sometimes there may be nothing particular to say.

Three of the dimensions are about ‘substantive elements’ of performance. These are ‘Content covered’, ‘Skills required’ and ‘Intended difficulty’, and will need close reference to the Mark Schemes (MS) as well as the Question Papers (QP).

The other dimensions are ‘non-substantive elements’ such as the format, wording and layout of the questions. These may need some reference to the Mark Schemes, but will mostly be focused on the Question Papers.

**Dimension 1: Content covered**
How Similar or Different are the question papers and marking schemes across a pair of years in terms of the **content that is covered**?

*Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.*

<table>
<thead>
<tr>
<th></th>
<th>12/11</th>
<th>10/09</th>
<th>08/07</th>
<th>06/05</th>
<th>04/03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content covered</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** (please type as many comments as you like about why you have given a particular rating)

**Dimension 2: Skills required**
How Similar or Different are the question papers and marking schemes across a pair of years in terms of the **skills that are required to answer the questions**?

*Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.*

<table>
<thead>
<tr>
<th></th>
<th>12/11</th>
<th>10/09</th>
<th>08/07</th>
<th>06/05</th>
<th>04/03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills required</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comments: (please type as many comments as you like about why you have given a particular rating)

Dimension 3: Intended difficulty
How Similar or Different are the question papers and marking schemes across a pair of years in terms of the intended difficulty of the questions?
Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Intended difficulty
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)

Dimension 4: Command words
How Similar or Different are the question papers and marking schemes across a pair of years in terms of the command words used (e.g. Explain, Examine, State)?
Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Command words
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)

Dimension 5: Question wording
How Similar or Different are the question papers and marking schemes across a pair of years in terms of the wording of the questions?
Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Wording
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)
Dimension 6: Question type/format

How Similar or Different are the question papers and marking schemes across a pair of years in terms of the question type or format? (For example, use of multiple choice, short answer structured questions and extended response questions.)

Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Question type/format
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)

Dimension 7: Layout

How Similar or Different are the question papers and marking schemes across a pair of years in terms of the layout of the questions in the paper?

Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Layout
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)

Dimension 8: Resources

How Similar or Different are the question papers and marking schemes across a pair of years in terms of the resources (e.g. maps, diagrams, photographs, texts)?

Please make your rating on the scale of 1–4 in the appropriate box below and then move on to the next dimension for that pair of years.

1 very different  2 quite different  3 quite similar  4 very similar

Resources
12/11  10/09  08/07  06/05  04/03

Comments: (please type as many comments as you like about why you have given a particular rating)
Stage 4:

Now that you have become familiar with the materials and completed your ratings, try to answer these supplementary questions for the whole set of question papers in your subject. We would like you to write a structured report on your observations, under the following headings.

1. How closely does the syllabus define the content and skills to be covered in the question papers and MS?

2. How far does the amount of choice allow students to prepare for only a few topics?

3. To what extent does the exam reward higher order skills (e.g. analysis, synthesis, evaluation) as well as recall?

4. How does the material you have looked at compare with any exams that you have experience with?

5. What do you think are the possible positive impacts of the assessment materials on teaching and learning?

6. What do you think are the possible negative impacts of the assessment materials on teaching and learning?

7. Is there an observable pattern to the order of questions in the papers?

8. Overall how predictable do you think this exam is over the ten years? (Please check one box below and then type as much as you like to comment.)

   Very unpredictable  Quite unpredictable  Neither predictable nor unpredictable  Quite predictable  Very predictable

9. If possible, please identify two or three examples of questions which illustrate some of the main points you have made in answer to the above questions. Please explain which points are illustrated.

10. Is there anything else you would like to add about the issues you have encountered, or about the experience of carrying out this exercise?

Thank you very much for your help and for the time you have spent completing this. Please could you email your responses by Monday 1st July? We look forward to meeting you and discussing findings on 9th July in Oxford.
Appendix D: Workshop Programme

Irish Leaving Certificate Predictability Project:
Exam Materials Workshop
Tuesday 9th July 2013
Department of Education, 15 Norham Gardens, Oxford OX2 6PY

AGENDA

9.00  Welcome and introductions

9.30  Predictability of examinations – Jo-Anne Baird and Therese Hopfenbeck

10.00 Table discussions of definition of predictability

10.15 Plenary on the definition

10.30 Findings from the examination materials research – Ayesha Ahmed

11.00 Coffee

11.20 Subject-specific discussions

- Compare ratings and discuss reasons
- Consider revision of ratings, noting any reasons
- Discuss examples that illustrate the issues and any areas of disagreement
- Indicate any surprising aspects of the study
- Summarise the main findings regarding predictability

13.00 Lunch

14.00 Plenary on findings

15.30 Tea

15.50 Revisit definitions, summary of findings from the day and next steps

16.15 Finish
Appendix E: Learning Objectives – Excerpts from Syllabuses

Leaving Certificate

Full syllabuses can be found online. Here we give a briefer digest of the learning objectives in the subjects included in this research.

General educational aims of the Leaving Certificate, expressed in the National Council for Curriculum and Assessment syllabuses, include the following:

The general aim of education is to contribute towards the development of all aspects of the individual, including aesthetic, creative, critical, cultural, emotional, expressive, intellectual, for personal and home life, for working life, for living in the community and for leisure. Leaving Certificate programmes are presented within this general aim, with a particular emphasis on the preparation of students for the requirements of further education or training, for employment and for their role as participative, enterprising citizens.

More specifically, it is written that

All Leaving Certificate programmes, in contributing to a high-quality education, emphasise the importance of:

- self-directed learning and independent thought
- a spirit of inquiry, critical thinking, problem solving, self-reliance, initiative and enterprise
- preparation for further education, for adult and working life
- lifelong learning.

Biology

Syllabus structure

The syllabus is composed of science for the enquiring mind, or pure science, which constitutes approximately 70% of the syllabus, and the technological, political, social and economic aspects of biology, which constitutes the remaining 30%.

The syllabus consists of three units:

- Biology – the study of life
- The cell
- The organism

http://www.curriculumonline.ie/en/Post-Primary_Curriculum/Senior_Cycle_Curriculum/Leaving_Certificate_Established/
Policy Context

Science education in the senior cycle should reflect the changing needs of students and the growing significance of science for strategic development in Ireland. Leaving Certificate Science syllabuses are designed to incorporate the following components:

- science for the enquiring mind, or pure science, to include the principles, procedures and concepts of the subject as well as its cultural and historical aspects
- science for action or the applications of science and its interface with technology
- science that is concerned with issues – political, social and economic – of concern to citizens.

The three components are integrated within each science syllabus, with the first component having a 70% weighting. The remaining 30% should be allocated to the other two components in the ratio three to one.

Aims

The aims of the syllabus are:

- to contribute to students’ general education through their involvement in the process of scientific investigation and the acquisition of biological knowledge and understanding
- to encourage in students an attitude of scientific enquiry, of curiosity and self-discovery through
  i. individual study and personal initiative
  ii. team work
  iii. class-directed work
- to develop an understanding of biological facts and principles
- to enhance an interest in and develop an appreciation of the nature and diversity of organisms
- to create an awareness of the application of biological knowledge to modern society in personal, social, economic, environmental, industrial, agricultural, medical, waste management and other technological contexts
- to develop in students an ability to make informed evaluations about contemporary biological issues.

Objectives

The objectives of the syllabus are:

(a) Knowledge, understanding and skills

Students should have a knowledge and understanding of biological facts, terms, principles, concepts, relationships and experimental techniques, including practical laboratory skills. Such skills should include

- an ability to carry out practical work, laboratory work and fieldwork activities safely and effectively
- an ability to record and interpret biological data.
(b) Application and interface with technology

Students should be able to apply, where possible, their knowledge and understanding of biology in environmental, industrial, agricultural, medical, waste management and other technological contexts.

(c) Science in the political, social and economic spheres

Students should be able to apply, where possible, their knowledge and understanding of biology in personal, social and economic spheres and to make informed evaluations about contemporary biological issues.

**Economics**

**Objectives**

1. To give students a general picture and an understanding of economic activities, patterns and principles.

2. To develop in students the capacity to apply these principles and to help them transfer this knowledge to new situations, and to achieve critical thought.

3. To develop in all our students an interest in everyday economics and to aid them in their education for citizenship.

4. To provide a suitable basis for further study of the subject.

**English**

A large part of the English syllabus deals with the learning objectives and there was too much text to reproduce here. Thus, we have been selective and present only the syllabus structure and aims and learning objectives sections.

**Syllabus structure**

2.1 The course is organised around two general domains:
   (i) comprehending
   (ii) composing

2.2 Within these two domains the students will be actively and creatively engaged in using language. The concept of shaping is central to these domains. Students in their comprehending tasks will come to understand how language shapes experience through style, genre, and context. In their composing tasks, students will be afforded the opportunity of using language to shape and order experience for themselves. The integration of the two domains in the teaching of this syllabus will be a vital necessity. The principle of integrating the teaching of language and literature, already central to the Junior Certificate syllabus, is of great moment here as well.

2.3 To give a more structured sense of development to the course, these two domains are to be largely encountered in the context of specific areas of language use and through the study of certain texts and resources.
2.4 There are many ways of classifying language use. However, for the purposes of this syllabus it is proposed to classify language under five general headings, which relate to the central concept of language as a powerful means of shaping and ordering experience. The five general headings are:

- The language of information
- The language of argument
- The language of persuasion
- The language of narration
- The aesthetic use of language

2.5 It is accepted that to classify language in this way is artificial. The general functions of language outlined here will continually mix and mingle within texts and genres. So, there can be an aesthetic argument, a persuasive narrative, or an informative play. But if students are to become adept with language, then they need to understand that it is through these functions, used within a variety of genres, that language achieves meaning, power, and effect.

2.6 It is of primary importance in this syllabus that the students should engage with the domains of comprehending and composing in oral, written and, where possible, visual contexts. The subject ‘English’ as envisaged by this syllabus is not limited to the written word. In the modern world, most students encounter significant language experiences in oral and visual contexts. The experience of language in the media in all forms, visual, aural and print, needs to be recognised as a prime, shaping agency of students’ outlook. This wide range of encounters with language will be reflected in the assessment and examination of students.

**Aims**

The aims of this syllabus are to develop in students:

3.1 A mature and critical literacy to prepare them for the responsibilities and challenges of adult life in all contexts.

3.2 A respect and appreciation for language used accurately and appropriately and a competence in a wide range of language skills both oral and written.

3.3 An awareness of the value of literature in its diverse forms for enriching their perceptions, for enhancing their sense of cultural identity, and for creating experiences of aesthetic pleasure.

3.4 In addressing these aims this syllabus will foster students’ development in the following areas:

3.4.1 Concepts and processes: the ability to think, reason, discriminate and evaluate in a wide variety of linguistic contexts – personal, social, vocational and cultural. In comprehending, students should be able to analyse, infer, synthesise and evaluate; in composing, students should be able to research, plan, draft, redraft and edit.

3.4.2 Knowledge and content: knowledge about the nature and uses of language and the variety of functions and genres in which it operates. In this context genres of literature will be of particular significance.
3.4.3 Skills: interpreting and controlling the textual features (grammar, syntax, spellings, paragraphing) of written and oral language to express and communicate.

3.4.4 Attitudes and effects: the development of interest and enjoyment in using language, a respect for its potential to make meaning and an appreciation of its diverse cultural manifestations.

3.5 Commentary on aims

It is a complex task to become literate in modern society. A bewildering variety of linguistic forms and styles challenges students today, both inside and outside of school. Developing control and power over language is the most essential educational achievement for all students if they are to become confident, thoughtful and discriminating adults and citizens.

If students are reflective about language they should come to recognise its unique power. They will come to see acts of speaking, listening, reading and writing not just as instrumental skills but as interpretative, creative activities through which specific meanings can be placed on experience. Through using language accurately and appropriately, they themselves can realise a sense of personal significance and discover how words can work for them in revealing meanings, inviting thought, and facilitating effective communication.

The aims outlined here are completely interdependent. Students cannot be taught concepts, skills and processes unless they find their encounters with language meaningful. Students will not respect language and their use of it unless they feel it contributes to their sense of understanding of the world. In trying to achieve these objectives it is vital that teachers introduce students to texts which create a meaningful context and invite dialogue and interaction. This interaction can be fostered by encouraging students to adopt a variety of critical stances, to question the authority of texts and to compare and contrast texts.

The development of oracy is a significant aspiration of this syllabus. To that end the development of methodological approaches which emphasise dialogue, group discussion, oral presentations and performances are strongly recommended. Students should be encouraged to express their opinions, speculate and engage in argument to foster their capacity to think well.

Learning outcomes

Within the five designated areas of language outlined earlier (2.4) viz.,

- The language of information
- The language of argument
- The language of persuasion
- The language of narration
- The aesthetic use of language

students will be required to develop the following range of skills and competencies:

4.1 The Language of Information
Students should encounter a range of texts composed for the dominant purpose of communicating information, e.g. reports, records, memos, bulletins, abstracts, media accounts, documentary films.

4.1.1 Comprehending

Students should be able to:

- Give an account of the gist of a text.
- Specify appropriate details for relevant purposes.
- Summarise the information they obtained from a text.
- Comment on the selection of facts given: evaluate the adequacy of the information and indicate omissions.
- Identify the point of view of an author.
- Outline the values assumed in a text.
- Indicate the genre of a text.
- Comment on the language use, structure and layout.

4.1.2 Composing

Students should be able to compose accurately in a range of information genres:

- Records: memos, minutes, notices, precis.
- Letters of all kinds.
- Reports and research projects.
- Various media scripts and newspaper reports.

4.2 The Language of Argument

Students should encounter a range of texts with an argumentative function. The range of texts should encompass material which offers models of both deductive reasoning and inductive reasoning as used in journalistic, philosophical, scientific and legal contexts.

4.2.1 Comprehending

Students should be able to:

- Outline the stages of an argument and identify the conclusion.
- Identify the reasoning structure evidenced in key words or phrases e.g. therefore, because, nevertheless, etc.
- Distinguish between statements/propositions and examples.
- Distinguish between opinion, anecdote and evidence.
- Evaluate the validity of an argument.
- Attempt to identify assumptions present.
- Outline the values being asserted.

4.2.2 Composing

Students should be able to:
• Put forward a theory or hypothesis.
• Justify a decision.
• Attempt an overview.

4.3 The Language of Persuasion

Students should encounter a range of texts which have a persuasive function, e.g. political speeches, advertising in all media, satiric texts, some forms of journalism.

4.3.1 Comprehending

Students should be able to:

• Identify the techniques being used to persuade, e.g. tone, image, rhythm, choice of words, selection of detail.
• Evaluate the impact of a passage in achieving its desired effect.
• Indicate to which audience it is addressed.
• Analyse the value system advocated and/or implied by the text.
• Outline whose interests it serves.

4.3.2 Composing

Students should be able to compose in a range of contexts:

• Newspaper articles
• Advertising copy
• Public relations/propaganda/political statements.

4.4 The Language of Narration

Students should encounter a wide range of texts which have predominately a narrative function. This should involve students in encountering narratives of all kinds, e.g. short stories, novels, drama texts, autobiographies, biographies, travel books and films.

4.4.1 Comprehending

Students should be able to:

• Develop an awareness of their own response to texts and analyse and justify that response.
• Indicate aspects of the narrative which they found significant and attempt to explain fully the meaning thus generated.
• Outline the structure of the narrative and how it achieves coherence within its genre.
• Develop an awareness of narrative characteristics of different genres and how the language in these genres is chosen and shaped to achieve certain effects.
• Approach narrative texts from a variety of critical viewpoints, e.g. analyse and compare texts under such categories as gender, power and class and relate texts from different periods and cultures.
• Compare texts in different genres on the same theme.

4.4.2 Composing

Students should be able to compose in a range of contexts:

• Anecdote
• Parable, fable
• Short story
• Autobiographical sketch
• Scripts
• Dialogues

4.5 The Aesthetic Use of Language

Students should encounter a wide range of texts in a variety of literary genres for personal recreation and aesthetic pleasure. This would include engaging with fiction, drama, essay, poetry and film in an imaginative, responsive and critical manner.

4.5.1 Comprehending

Students should be able to:

• Develop appropriate stances for reading and/or viewing in all literary genres. This means students should approach drama scripts from a theatrical perspective, view films as complex amalgams of images and words and read poetry conscious of its specific mode of using language as an artistic medium.
• Engage in interpretative performance of texts.
• Develop an awareness of their own responses, affective, imaginative, and intellectual, to aesthetic texts. Explore these responses relative to the texts read, generate and justify meanings and build coherent interpretations.
• Re-read texts for encountering rich and diverse levels of suggestion, inference and meaning.
• Attempt to compare and evaluate texts for the quality of the imaginative experience being presented.

4.5.2 Composing

Students should be able to:

• Compose within the aesthetic forms encountered.
• Compose ‘interventions’, i.e. alternative scenarios based on texts studied.
• Keep response journals – expressive of their growing acquaintance with a text over a period of time.
• Compose analytical and coherent essays relative to a text.

**French**

**Syllabus structure**

The syllabus aims to lead every pupil towards the basic outcome as a result of the experience of modern language learning in the classroom:

a. a communicative competence in the target language
b. awareness about language and communication
c. an understanding of how to go about learning a foreign language
d. a level of cultural awareness

**General aims**

The following general aims are proposed by this syllabus for the teaching and learning of modern languages in the senior cycle.

To foster in learners such communicative skills in the target language as will enable them to:

• take a full part in classroom activities conducted in the target language;
• participate in normal everyday transactions and interactions, both spoken and written, both at home and abroad;
• extract information and derive enjoyment from the mass media and the more accessible literature of the target language community;
• consider as a realistic option the possibility of pursuing leisure activities, further study and/or career opportunities through the medium of the target language.

To give pupils a critical awareness of how meaning is organised and conveyed by the structures and vocabulary of the target language, and thus to contribute to their understanding of the workings of human language in general.

To help learners develop strategies for effective language learning.

To equip learners with a broad acquaintance with the cultural, social and political complexion of countries in which the target language is a normal medium of communication and thus to help raise their awareness of cultural, social and political diversity generally.

**Behavioural objectives**

For each activity or theme, the syllabus outlines the basic communicative proficiency required. This involves outlining performance targets (e.g. asking what language someone speaks), linguistic skills (e.g. developing correct usage of question) and structures and grammar (e.g. use of tu/vous). There is then a description of language awareness requirements (e.g. exploring the main points from a spoken or written target language text). Finally, the cultural awareness requirements are set out (e.g. understanding the main elements of the surface meaning of a modern literary text in the target language).
Geography

Rationale

Geography is concerned with the study of people and their environment. A study of geography will help students develop an understanding of their physical and human surroundings. It examines the changing inter-relationships between the physical and human worlds. Through their study of geography, students will develop geographical skills that will help them make informed judgements about issues at local, national, and international levels.

Aims

• To develop a knowledge and understanding of a selection of contrasting physical and human (social, economic, and cultural) environments and of the relationships that exist between them.
• To promote an awareness of the spatial, structural, and temporal patterns of environmental phenomena, both physical and human, at a variety of scales, and to realise that these patterns can change with time.
• To understand the opportunities for, and challenges of, global interdependence.
• To promote the conservation and sustained management of the earth’s resources for the welfare and happiness of its inhabitants and for future generations.
• To recognise, and be sensitive to, other people and their culture, here in Ireland and elsewhere.
• To develop a variety of geographical skills which can be applied to the world of work and to many other aspects of life.
• To develop and promote active citizenship and to encourage informed participation, through lifelong learning, in society at local, national, European and global levels.
• To encourage the use of information and communication technologies in the teaching and learning of geography.
• To assist students to become well-informed and responsible citizens and to enable them to progress to further studies or to enter the world of work.
• To provide students, through their study of geography, with an interesting and enjoyable experience and imbue in them a lifelong love of their natural and cultural environment.

Objectives

The course objectives list the knowledge and understanding, concepts, skills and attitudes which students should acquire through their study of Leaving Certificate geography. They are based on, and progress from, the objectives in the Junior Certificate geography syllabus.

1. Knowledge and understanding

From this syllabus, students should acquire knowledge and develop an understanding, from a local, national and international perspective of

• basic spatial relationships
• physical and environmental phenomena and processes
• social, cultural and economic phenomena and processes
the interaction and inter-relationships between physical, environmental, social, cultural and economic phenomena
• the practical aspects of these different phenomena as they relate to the student’s local environment and community.

2. Course concepts
Students should understand the key concepts of
• location
• spatial distribution
• areal association
• inter-relationship
• spatial interaction
• density
• pattern
• region
• change over time.

Students, while developing their ability to use and apply these concepts, should also develop their problem-solving skills, and understand processes and systems relevant to each concept.

3. Skills
Students should have the opportunity to develop the following skills, where appropriate, as they study all aspects of the syllabus:

• information gathering skills
  o maps of various scales including Ordnance Survey maps and synoptic weather maps
  o figures (line graphs, bar graphs, pie charts, diagrams and pictorial models)
  o statistics
  o photographs, including aerial and satellite photographs
  o pictures, including cartoons
  o textual sources with geographical terminology
  o information and communication technology sources (e.g. computerised data and packages, TV and radio programmes, internet, audio and digital sources) GIS and satellite imagery

• presentation and communication skills
  o present and communicate information and ideas in a variety of ways (including maps, figures, statistics, written and oral)

• investigative skills
  o select and use a variety of modes of investigation
  o carry out a geographical investigation using both primary and secondary sources of information

• social skills
• develop social skills (e.g. working effectively alone or in groups, following instructions, teamwork and co-operation, use of verbal communication to find out, debate and pass on information)

• evaluation skills
  o synthesise, analyse, interpret and evaluate information (e.g. distinguish fact from opinion, draw conclusions, prove simple hypotheses, make informed judgements, suggest sensible solutions to problems and, where appropriate, suggest realistic plans for action).

4. Attitudes
Students should be encouraged to develop positive attitudes towards themselves, others, and their environment. Such attitudes include:

  o a willingness to perceive and evaluate natural and cultural phenomena from the point of view of others
  o an appreciation of social, cultural and environmental diversity
  o an awareness of the dangers of all types of stereotyping and prejudice
  o sensitivity to the aesthetic quality of the natural and cultural environment, leading to a desire to maintain and enhance this quality.

Geographical skills
The learning, use and application of geographical skills is central to a student’s experience of Leaving Certificate geography. Geographical skills are central to all parts of the syllabus. The core geographical skills are listed for study in Core Unit 3 and are to be studied by all students. A list of skills is also included in the introduction to each of the syllabus units. These listed skills should be integrated into the teaching of all the syllabus units as appropriate. These core geographical skills will also be used and applied in the preparation of the geographical investigation at both Higher and Ordinary levels. The student’s competency in the application and use of geographical skills will be examined in the context of the terminal written examination and the geographical investigation.

The geographical investigation
The geographical investigation is a core area of study and as such is compulsory for all students. Field studies and investigations using primary and secondary sources are central to the geographical education and experience of all students. The investigation will allow the student to experience the practical application of the core geographical skills that are central to all units of the syllabus. The geographical investigation will allow the student to experience the key aims of the syllabus in the context of their own environment. The investigation also encourages students to develop positive attitudes by both experiencing and questioning relationships and issues in their own environment. The investigation represents the practical application of the core geographical skills listed in the syllabus. The students, having studied and practised the geographical skills listed, will then apply the appropriate skills to the investigation topic. In the process of completing the geographical investigation students will be required to

  • devise a strategy and identify aims, objectives, and hypotheses to allow for the effective investigation of the topic
Design and communication graphics

Introduction

Technology education is an essential component of the curriculum. In a world where encounters with a wide range of technologies are part of the daily life experience of all people at work or at leisure, students should be equipped to face these encounters with the confidence which comes from learning about, through and with a range of technologies. It is equally important that they gain an appreciation and understanding of the complex interface between technology and society. As citizens they should have the capacity to enter discussion about, and make personal judgements on, issues related to the impact of technology on their own lives, on society, and on the environment.

Through technology education students grow in competence, grow in confidence, become more enterprising and are empowered in terms of their ability to control elements of the physical environment. These are important educational outcomes, which contribute significantly to the provision of a broad and balanced curriculum and illustrate why participation in technology education represents a valuable educational experience.

The nature of technology education

Technology is a distinct form of creative activity where human beings interact with their environments, using appropriate materials and processes in response to needs, wants and opportunities. It integrates problem solving and practical skills in the production of useful artefacts and systems.

More specifically, the value of technology education comes from the use of the wide variety of abilities required to produce a drawing or make an artefact, leading to a sense of competence and a feeling of personal empowerment. The acquisition of manipulative skills is an important component of this sense of competence and can help to give students a feeling of control of their physical environment. In a rapidly changing global society, students need to appreciate that technological capability is necessary and relevant for all aspects of living and working. Many subjects can contribute to the development of a technological capability. However, the technology subjects, which incorporate the principles of design and realisation in a creative manner, are central to this development.

Technological capability includes

- the understanding of appropriate concepts and processes
- skills of design and realisation
- the ability to apply knowledge and skills by thinking and acting confidently, imaginatively, creatively and with sensitivity
The ability to evaluate technological activities, artefacts and systems critically and constructively.

**Leaving Certificate technology subjects**

Within the Leaving Certificate (Established) programme, technology education is provided through four syllabuses, thereby giving progression from technology education in the junior cycle. These subjects contribute to a broad, balanced and general education of students, with particular reference to their vocational, further education and training aspirations on completion of the Leaving Certificate.

At a more practical level, the technology subjects at senior cycle share a number of common features. The syllabuses

- are constructed on the basis of core areas of study and optional areas of study, reflecting the different topics and sections within the subject area
- are offered at two levels, Ordinary and Higher
- have been designed for completion in 80 hours of class contact time
- place a strong emphasis on practical learning activity
- include a range of assessment components aimed at assessing student achievement in both practical and theoretical aspects of the subjects.

**Aims**

The general aims of technology education are

- to contribute to a balanced education, giving students a broad and challenging experience that will enable them to acquire a body of knowledge, understanding, cognitive and manipulative skills and competencies and so prepare them to be creative participants in a technological world
- to enable students to integrate such knowledge and skills, together with qualities of cooperative enquiry and reflective thought, in developing solutions to technological problems, with due regard for issues of health and safety
- to facilitate the development of a range of communication skills, which will encourage students to express their creativity in a practical and imaginative way, using a variety of forms: verbal, graphic, model, etc.
- to provide a context in which students can explore and appreciate the impact of past, present and future technologies on the economy, society and the environment.

The additional syllabus aims are

- to develop the cognitive and practical skills associated with communication graphics, problem solving and critical thinking
- to develop the capacity and ability of students in the area of visuo-spatial reasoning
- to provide a learning environment where students can plan, organise and present appropriate design solutions using a variety of skills, techniques and media
- to provide a basis for lifelong learning
to develop an appreciation for, and understanding of, aesthetic principles and their importance in design and the human environment.

**Objectives**

The objectives of this syllabus are to develop the student’s knowledge, understanding, skills and competencies in design and communication graphics, while fostering positive attitudes to the use of graphics in problem solving.

On completion of their studies students should be

- familiar with the principles, concepts, terminology and methodologies associated with the graphics code
- able to apply the principles of both plane and descriptive geometries to the solution of a variety of concrete and abstract graphic problems
- able to produce neat and accurate drawings that comply with internationally recognised standards and conventions
- able to model, in two and three dimensions, graphic design problems and solutions, utilising a range of appropriate techniques and media with confidence and discernment
- appreciative of the facility which the graphics code provides, in the solution of problems and in the visual communication of data
- able to utilise freehand sketching, both two and three dimensional, as a means of communication and as an aid to spatial reasoning and refinement
- able to utilise a variety of rendering and presentation techniques in the solution of graphic design problems, in both two and three dimensions
- competent and confident in the application of CAD and other appropriate Information and Communication Technologies (ICT) in the solution, modelling and presentation of graphic design solutions, in two and three dimensions
- able to interpret verbal, written and mathematical information, and to represent it graphically
- able to evaluate design solutions and solve design problems on the basis of sound aesthetic principles and to appreciate the impact of design on the visual quality of the human environment
- appreciative of the broad vocational relevance of design and communication graphics.

**Student assignment**

The purpose of the assignment is to assess those elements of the course that cannot be readily assessed through the terminal examination, in particular elements of design and communication graphics and the utilisation of ICT in design. The assignment will relate to a theme identified by the examining authority. A different theme will apply at Higher and Ordinary levels. Students must then proceed to develop a design or project brief in accordance with specified parameters. The assignment will take approximately 40 hours to complete. The completed assignment may take the form of

A design investigation and modification
A design investigation and concept design.

The learning outcomes related to the student assignment will result in students being able to

- represent design and communication information through sketches, drawings, CAD and other ICT applications
- use appropriate presentation techniques, including colour, rendering and sketching, to represent an artefact and/or design
- produce appropriately dimensioned 2D and 3D drawings and models using CAD
- appreciate, analyse, evaluate and modify artefacts from a design perspective
- demonstrate design and visualisation skills and techniques.