The Irish Journal of Education, 1970, iv, 1, pp. 5-18

THE QUALITY OF THE IRISH LEAVING CERTIFICATE EXAMINATION *

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Questions in nine subjects of the 1967 Irish Leaving Certificate Examination were studied. A group of raters judged the intellectual skills which each question was most likely to bring into play on the basis of their knowledge of the subject matter of the Leaving Certificate course, of student notes and text-books and with the assistance of marking guides. The six major categories of Bloom *et al's Taxonomy of educational objectives* were used in the classification of intellectual skills. In the case of languages, the taxonomic classification was supplemented by a linguistic one. In the questions studied, it was found that greater weight was placed on knowledge (i.e. the learning and retention of information) than on higher skills.

At the end of his secondary-school† education, at about the age of eighteen years, an Irish student sits for the Leaving Certificate Examination (LCE), a public examination run by the government's Department of Education. If the student is successful he is awarded a certificate which testifies to the satisfactory completion of that phase of his education. In addition, the level of his success in the examination, expressed in terms of marks, is one of the principal factors which decides which careers are open to him. Results on the LCE are among the principal means employed by Irish society for admitting persons to university, teacher training, the civil service and numerous other careers. Perhaps it is inevitable, then, that the LCE should dominate secondary education and should to a very great extent determine how teachers in such schools teach, and how students study. Hence it is a matter of some importance to investigate the nature of the influence exercised by this examination and to inquire whether the marks awarded are a fair and valid indication of a student's accomplishments.

*This paper is excerpted from a report submitted by the authors to the Irish Department of Education in January 1969 (5). The study was funded by the Department of Education and the authors wish to express their gratitude to Sean O'Connor and to Seamus O Ciarnáin of the Department.

† The term 'secondary school' is used in Ireland to denote what in Britain would be called a 'grammar school.'

Doubts about the effects of the LCE are not, of course, new. The present LCE can be traced back to the year 1879 when the first public examinations for secondary-school students were held under the direction of the Intermediate Education Board for Ireland. In the first official review of the Board's work, carried out and published by the Intermediate Education Commission in 1889, we find the recommendation 'that the papers set in the examination should be of such a character as to test true educational work, as distinct from the mere overloading of the memory' (cited in 3, p. 50).

The issue has been raised many times since, but whereas previous writers divided abilities into rote memory and ability of a higher order, we will be working with a breakdown of intellectual abilities into six categories. The six categories form the basis of a classificatory scheme developed by a group of American educationists who saw the need for a precise classificatory system to facilitate communication about educational objectives and testing procedures (1). Without such an agreed system they had come to realize that attempts to share ideas and test-items were beset by ambiguities and misunderstandings.

THE TAXONOMY

The Taxonomy is a hierarchical classification of the intellectual skills brought into play by an examination. Each level of the hierarchy is accompanied by a definition of the intellectual skills classified at that level, by examples of test items that could be used to measure these skills together with a discussion of the problems associated with measuring them. The six categories are arranged in sequence from simple to complex skills. The skills at each level are built on and pre-suppose the skills of lower levels. For example, Comprehension pre-supposes Knowledge as well as the ability to comprehend; Analysis pre-supposes Knowledge, Comprehension and Application. The following description of the six major categories is taken mainly from pages 201 to 207 of the Taxonomy (1). Subdivisions are not included here, nor were they employed in our analysis of the LCE: classification by subdivision would have required discriminations too fine for adequate rater agreement.

1. *Knowledge:* Knowledge items require little more of a student than that he remember what he learned in a form close to that in which he learned it. The emphasis in such items is on memory.

2. *Comprehension:* Items at this level require students not only to recognize or recall the information they learned but to use it in some new

way, for example, by translating it into a new form, by re-ordering it into a new configuration, or by summarizing it. The key idea of the level is that students demonstrate that they have understood what they learned.

3. *Application:* The emphasis at this level is that students select and apply to *new* material principles which they have learned in connection with some other material. A major part of the difficulty of an Application problem is recognizing that it falls into a particular class of problems. Further, the student is then required to apply the appropriate principle and solve the problem.

4. *Analysis:* Emphasis here is on the breakdown of material into its constituent parts and on the detection of *unstated* (*hidden*) assumptions, or relationships, or organizing principles.

5. *Synthesis:* This involves the combination of elements to form a new unity or new structure, as in the writing of an original essay or in the formulation of an original research design.

6. *Evaluation:* Evaluation involves value judgments in terms of expressed criteria, about literary or other works. The judgments may be either quantitative or qualitative, and the criteria may be either given to the student or determined by him.

Empirical studies designed to investigate how well the Taxonomy describes actual intellectual functioning are as yet rather limited.* Nevertheless, Kropp and Stoker in an important study conclude that 'there was a clear tendency for the empirical data to support the imputed hierarchical structure of the Taxonomy' (4, p. 168). The authors of the Taxonomy assume that it transcends course content, i.e., that the Taxonomy is equally applicable to all areas of study. Our own experience in applying it to the different LCE subjects is that while the assumption is in general valid, the Taxonomy is less useful in classifying linguistic skills than skills associated with mathematics, history, geography and the like. In classifying students' skills in Irish, French and Latin, then, we applied along with the Taxonomy a more familiar linguistic classificatory system.

METHOD

Applying the Taxonomy

The subjects which we chose for special study in the present investigation are: English, Irish, French, Latin, history, geography, mathematics, physics and chemistry. We thus confined ourselves to the most popular

* For an annotated bibliography of research on the Taxonomy, see Cox and Unks (2).

subjects while also sampling the principal areas: vernacular, modern continental and classical languages, social sciences, physical sciences and mathematics.* For each subject there were separate pass and honours papers; we studied both. The papers we studied are those for the year 1967. Several changes in the LCE have subsequently been made or proposed but these are related more to the grouping of subjects and to course content.

The activity for which each group of marks was awarded for each subquestion of each of these examinations was classified into one of the six major categories of the Taxonomy. Naturally, the raters who made the classifications could not observe each student as he sat for the LCE and divine his intellectual functioning as he answered each question. Instead the raters attempted to determine, from their experience of students and from relevant materials supplied to them, the level at which most students would most probably have functioned in answering a particular question. The raters kept in mind that the ability called into play by a particular question might have been very different from what the examiner in framing the question had hoped it would be. For example, the examiner might have hoped that a question would demand an answer at the level of Application; students might have anticipated the question and committed the answer to memory and in the examination functioned at the level of Knowledge. The raters' attention was centred on students rather than examiners.

The nature of students' activities was inferred from several sources of information. First the Department of Education provided copies of textbooks which, in the judgment of the secondary-school inspectors, were widely used by LCE students. The reviewers examined these texts in relation to the question papers and the accompanying marking guides. If the answer to a question was explicitly available in the text, the reviewers assumed that the question did not pose a new task for the student and should be classified at the level Knowledge.

The second source of information was copies of commercially available review notebooks published by local firms. These copies were mainly collected from 1967 LCE students. For purposes of taxonomic classification they were used in a manner similar to the textbooks. Time and again answers which would have fully satisfied the examiners were found in these notebooks and guided the raters in their classification of a particular question.

* The subjects which were examined for the 1967 LC but which we did not study are: Greek, German, Italian, Spanish, Hebrew, applied mathematics, music, general science, botany, physiology and hygiene, physics and chemistry (a single subject), agricultural science, domestic science, commerce, drawing and art.

Notebooks written by students themselves in preparation for the LCE were also studied. These notebooks were collected from a small number of students who attended different schools in the West of Ireland; they form a purposive sample rather than a representative one. They contained for the most part notes dictated by teachers of LC courses, but they also contained many examples of students' homework.

Further, the 1967 marking schemes or guides, made available by the Department of Education, were used to gain insight into the expectations of examiners. We made the assumption that from previous LCEs students and teachers alike had a good idea of the sorts of responses which would gain marks. Thus, indirectly, the marking schemes were an indication of students' intellectual activities during the LCE.

Finally, the Department furnished us with a number of marked answer books. For each exam studied the Department furnished twelve such booklets which in their judgment represented the range of student performance. These were studied to discover the sorts of response which received high, medium and low marks.

The Raters

Two groups of raters, one American and one Irish, classified the LCE questions. Among the American raters, two worked on the mathematics papers, two on the history and geography papers, three on the physics and chemistry papers and one on the French paper. The raters were all experienced secondary or college teachers in the subject area of the test which they rated. They also had studied educational measurement and evaluation, and were familiar both with test construction and with the Taxonomy.

The Americans who rated a particular paper did so independently of one another. There was very high agreement among them; in the case of every paper there was perfect agreement in the classification of at least seventy-nine per cent of the items. With the exception of the English composition—which cannot here be discussed further—no two classifications of any item were further apart than one taxonomic level. When raters disagreed about the classification of an item they met to discuss and resolve the differences. In all but a trivial number of instances they succeeded in doing so.

The two Irish papers, the two Latin papers and the honours geography papers were classified by Irish raters. The two raters for the Latin papers were teachers with degrees in Latin. The two raters of the Irish papers had degrees in Irish and were experienced teachers of Irish. The single rater

for honours geography had his degree in history but was an experienced teacher, and LCE marker, of geography. The Irish raters were guided in the use of the Taxonomy by one of the present authors.

The classification agreed upon by the American raters was checked by one or by two Irish teachers who had experience in teaching the appropriate subject. These teachers had been familiarized with the Taxonomy by one of the present authors. There was general acceptance by these of the American ratings. However, they tended to rate history and geography (pass) items lower than the Americans had done and to rate mathematics items higher. One of the authors who had worked with the Irish teachers later explained any disagreements which the Irish teachers had had to the American raters. On hearing the Irish teachers' comments about teaching methods and students' preparation for the LCE the American raters were usually quick to agree. However, there were a few cases where agreement was not reached but space does not permit us to discuss them here.*

RESULTS

Taxonomic levels

The results which are set out in Table 1 are based on all the marks associated with each examination, pass and honours, rather than on the maximum number of marks which a student could gain. In history there were two courses at each level, pass and honours; in Table 1 the two courses are combined. Similarly, when an exam consisted of two papers (e.g., honours English) we combined the marks.

A few examples of how questions were assigned to different taxonomic levels will illustrate both the Taxonomy and the process whereby it was applied. Many readers might be surprised to find all the history marks placed under Knowledge (Table 1). The reason is that adequate answers (in terms of marks) were available to students many times over, in their textbooks, review notebooks and in their class notes. They would have received full marks if they had succeeded in memorizing the substance of any of these sources. No marks were awarded for originality or excellence of expression, organization or interpretation.

Both English exams carried a precis question which is a good example of Comprehension. The student was required to show that he understood an English prose passage by expressing an abbreviation of it in his own words. However, the subject with the highest proportion of marks under Comprehension is mathematics. This is because of the large number of

* The details are discussed in Madaus and Macnamara (5).

TABLE 1

PERCENTAGE MARKS FOR ALL QUESTIONS IN EACH SUBJECT BY TAXONOMIC LEVEL

		Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
English	Pass	69	17	2	—	12	—
	Hons	66	16	3	—	16	—
Irish	Pass	35	20	19	—	25	—
	Hons	43	12	19	—	27	—
French	Pass	15	30	55	—	—	—
	Hons	16	29	55	—	—	—
Latin	Pass	49	2	14	36	—	—
	Hons	45	4	19	32	—	—
History	Pass	100	—	—	—	—	—
	Hons	100	—	—	—	—	—
Geography	Pass	90	8	—	2	—	—
	Hons	90	2	1	1	6	—
Mathematics	Pass	9	65	17	9	—	—
	Hons	7	53	28	12	—	—
Physics	Pass	90	10	—	—	—	—
	Hons	76	11	13	—	—	—
Chemistry	Pass	83	2	15	—	—	—
	Hons	69	21	7	2	—	—

problems which required a student simply to change an expression from one form to another, e.g., to find the factors of an algebraic expression. A problem was classified at a higher level than Comprehension, however, if it was thought that candidates would generally have difficulty in recognizing which type of problem it was, or if there were special difficulties associated with the translation from one form to another.

The reason for the relatively large number of Irish, French and Latin marks under Application, compared with English, is that to all but a tiny minority these three languages were 'second' languages which they had learned in school. A large proportion of the marks in these exams went for correct and accurate application of the rules of grammar. Their classification under Application indicates the belief that most LCE students would not have acquired such command of these languages as to apply the rules automatically and intuitively as they did those of their native English.

Latin has more marks under Analysis than any other subject: these are the marks awarded for the translation of unseen Latin passages. The classification expresses the belief that students at the LCE level could generally arrive at the structure of Latin sentences only by careful study of the various words used, their form classes and their morphology. They would then have had to co-ordinate the outcome of their observations and thus reach the intention of the writer. The examiner assumed on the part of students sufficient knowledge of English (or Irish) to express the meaning of the passage. He did not allot marks for special sensitivity in the use of English (or Irish). Thus, the exercise is properly classified under Analysis.

Apart from a few marks in geography, the only marks classed under Synthesis are those associated with the essay in English and Irish. This classification of the essay is justified only if it was an original composition, if it represented a new organization of ideas and a certain aptness in their expression. The placing of these marks under Synthesis is, perhaps, optimistic. Probably the best essays in both subjects involved Synthesis, but essays of average or poor quality scarcely did. The French exams also required the student to write a brief essay, but as neither originality of ideas nor of expression was expected they were not classified as Synthesis.

No marks have been listed under Evaluation. Several of the literature questions might at first appear to involve Evaluation. For example, section A of the second honours question on Hamlet reads: 'What do you think of Hazlitt's dictum that "it is we who are Hamlet"?' However, a complete answer (in terms of marks) to this and to all the other Shakes-

peare questions was to be found in a review notebook.* The question could also have been answered by repeating the substance of the prescribed essay by Hazlitt on Hamlet as found either in the essay itself or in the synposis of the essay contained in another book of notes.†

All this is not to deny that many students expressed their own personal evaluations of the texts, or that many teachers encouraged them to do so. The c'assification, Knowledge, for the literature questions merely asserts that the examination did not require a personal response, that no marks were added for original thought, and that the majority of students probably did no more than was required of them.

Linguistic Skills

The Taxonomy is mainly a logical scheme for classifying intellectual functioning and as such it can most readily be applied to such abilities as those called into play by questions on literature, on difficult points of grammar and by the requirement to marshal ideas and express them in an essay. Accompanying all these activities in a role which is at times more to the forefront and at times less so is a range of linguistic functions. In an analysis based on the Taxonomy such functions tend to be obscured, and yet these functions may form the major objectives of a language course.

For this reason we supplemented the taxonomic analysis of Irish, French and Latin with a linguistic one. In effect we posed ourselves the question, what aspects of reading, writing, listening and speaking were examined in the 1967 exams in these subjects.

Of the three examinations, Irish was the only one in which an oral test was given. Since we did not make a special study of the Irish oral test we cannot discuss the speaking and listening skills there tested. However, the syllabus states that attention would be paid to phonetics, vocabulary, grammar and the fluency of the student's attempts to speak Irish. On the other hand, the student was asked questions in Irish, so he had to have at least some capacity to understand spoken Irish.

In all three language exams, ability to read the language was tested by requiring the student either to read the exam questions in the language (Irish and French) or by having him translate passages from the language into English (in French and in Latin) or by examining him on prescribed literary texts or authors in the language (Irish, French and Latin). Further,

* Murphy, D. J. *Notes on Hamlet*, Dublin: Folens, n.d.

† Doyle, B. *English prose notes for the Leaving Certificate*, 1966-67, Dublin: Folens, n.d. Pp. 36-43.

all three language exams carried questions which were specifically designed to test detailed knowledge of the vocabulary, idiom and syntax of the prescribed literary sources. However, in review notebooks students had available synopses of their Irish and French texts as well as lists of those phrases on which they might be asked to comment in the exam. Moreover, translations of the Latin sources were readily available. A student, therefore, could have satisfied the examiner in any one of these languages without having carefully studied the texts, and we have been given to believe that many did. On the other hand, in Latin and in French, but not in Irish, students were required to translate unseen passages into English or Irish. Success in these tasks depended mainly on ability to read the languages.

Ability to write Latin was tested in the composition item, i.e., translation from English (or Irish) into Latin. The marking of pass papers was rather lenient. For example, pass students were asked to translate: 'The sailor had promised to return to Brundisium, but he was persuaded to remain in Rome.' The following is the attempt of one student who obtained 43 of the 80 marks awarded for composition: *Marina promissit revenire Brundisium, sed persuasi erat manere Roma.** For this he received ten marks out of a possible twenty even though every word with the exception of *sed* and *Brundisium* was wrong. The standard demanded of honours candidates was far higher. The first sentence of their composition ran: 'When his enemies arrived in Rome, Cicero had already fled.' The following attempt gained only one out of a possible eight marks: *Cum hostes sui Romam adveniunt, Cicero jam fugisset.* †In general, then, honours, but not pass students were required to have a thorough grasp of the stock-in-trade of Latin syntax as well as the limited vocabulary which has become associated with Latin composition.

In Irish and French the linguistic skill most thoroughly tested was ability to write one's ideas in one's own words. For example, among the Irish scripts available to us we found that in answering the two papers a good student wrote as many as sixteen foolscap pages of Irish, while a weak student wrote about six. The French answerbooks were typically shorter and contained some English, yet here too markers had before them a fairly large sample of the student's writing in the language that was being examined. In both exams the entire sample of the student's writing, not merely the essay, was examined from the point of view of spelling, vocabulary, idiom and grammar. Ability to write these languages was, then, care-

* The following is a correct translation: *Nauta Brundisium se rediturum esse promiserat, ei autem est persuasum ut Romae maneret.*

† The following would suffice: *Cum inimici ejus Romam advenissent, Cicero jam fugerat.*

fully tested, though technical improvements which we describe elsewhere (5) could make the examinations more thorough in this regard.

CONCLUSIONS

The weight of the LCEs which we studied is placed on Knowledge, that is upon the learning and retention of information. It is not for us to say whether or not this is a satisfactory state of affairs; that is rather for the teachers to say. Moreover, we are by no means opposed to a student being required to commit information to memory. At the same time we feel sure that all teachers would agree that there is more to education than stocking the memory.

One of the principal causes for the emphasis on Knowledge in the 1967 LCEs was the syllabus which for each subject was stated almost exclusively in terms of the content to be covered. For example, the main items in the English syllabus were the Shakespearean play to be studied, the poems and the essays. The history syllabus just gives the period. It is inevitable, then, that teachers, students and examiners alike should feel that content is everything and settle for Knowledge. If *Hamlet* is prescribed for an examination, but no directions are given about how to study it, it is hardly surprising if the majority of students consider their task complete when they have acquainted themselves with the *dramatis personae*, the plot, and some oft-quoted lines.

To escape from the trap into which the Irish secondary-school system seems to have fallen there is need for a completely new type of syllabus. We welcome the changes which have been made and are still being made in the LC syllabuses, but we fear they are inadequate. There is need for an explicit statement about the content required when a body of poems, say, is prescribed: the dictionary meanings of the difficult words, the incidents and persons in classical mythology to which reference is made, perhaps the views of certain critics about the meaning and import of the poems and about their place in English literature, or whatever else a student might be expected to read and learn about poetry. In addition there is need of an explicit statement about the various levels at which a student is required to function in relation to a poem: to reproduce eight lines from memory, for example, to express in his own words an acceptable meaning of any section of a poem, to analyse assumptions about society, or man's aspirations, implicit in the poem, and to evaluate the poem against the background of other poems of the same genre.

In other words, a syllabus should be composed with reference to two axes, one expressing the content, the other expressing the various levels of intellectual functioning. The two axes are equally important, and the resultant syllabus should be as explicit as possible. Some teachers may object to a syllabus which from many points of view may appear rather tedious. A syllabus, however, should be regarded as a legal document binding on examiners as well as on teachers, and agreed upon by both. No one objects if a legal document is tedious.

It is clear that a further source of weakness was the examination questions and the accompanying marking schemes. In several questions, especially in English, the examiner intended to elicit personal responses of a high intellectual calibre; the majority of the responses they elicited were unlikely to have been either personal or of a high calibre. The questions were so general and the marking schemes so vague that markers were compelled to reward any answer whether 'borrowed' or the student's own. If the examiner seriously intends to invite personal responses, two lines of action are open to him. Either he must study the notes generally available to students and set questions which cannot be answered from such notes, or he must place a premium on originality by refusing to assign more than a predetermined proportion of the marks, say forty per cent, to a stereotyped answer. The second alternative presupposes that all markers should acquaint themselves with commonly available notes. Furthermore, the present practice of having all the scripts from any particular school marked by the same marker could be used to guard against prepared answers which originated with the teachers. If both these precautions were taken, it is to be hoped that markers, themselves experienced teachers, could recognize originality and allot marks higher than forty per cent according to the quality of original responses. It would of course be necessary to give adequate warning to schools that the style of marking was about to change. Actual examples of the new style of question, answer, and marking directions would serve to allay many fears and guide teachers towards the new style of work.

One important feature of the 1967 LCEs does not emerge in the analysis as we have here presented it.* Most examinations permitted students to choose the questions which they would answer. For example, the geography papers carried ten questions apiece. In each of these papers candidates were required to answer only six questions. The result was that students were assessed on different material. But in addition the questions

* The taxonomic classification is given question by question in the complete report of the study (5).

in each of those papers varied in taxonomic level. It follows that the intellectual levels at which students were required to function depended upon the choice of questions. Thus the comparability of marks awarded on the same paper is questionable on two accounts—the material, and the taxonomic level of the questions chosen by candidates. These particular difficulties might easily be overcome by having every candidate attempt the same set of questions.

Perhaps the major conclusion from the linguistic study of the French paper is the need for an oral test. Though the syllabus places emphasis on the importance of listening and speaking skills in French, students are not examined in such skills. It is evident, then, that the exam does not match up to the course objectives.

Both in French and in Latin great importance was attached to translation both from the vernacular into those languages. and also from those languages into the vernacular. Candidates in French were not allowed a pass in the French exam as a whole unless they passed in translation from English or Irish into French. Since translation is a rather specialized skill which does not enter into normal linguistic functioning, one wonders about the wisdom of so great an emphasis on translation in these exams. There is no translation in Irish, and in Italian, for example, an LC student is required to read an Italian passage and answer questions about it in Italian; he is not required to translate from Italian into English or Irish. The same is true, *mutatis mutandis*, of the LC German examination.

Our final query relates to the distinction between honours and pass papers. With the exception of physics, the syllabus for each subject indicates additional material to be studied by honours candidates over and above that to be studied by pass candidates. The amount of extra material for honours students varied considerably. Honours history students were merely required to have a more detailed knowledge of the periods prescribed for pass students; honours mathematics students on the other hand had a large body of additional material. In general, however, the honours and pass papers were closely matched in form and style; they differed mainly in the range of topics examined. In particular, they differed little in the range of taxonomic levels called into play. One wonders, then, about the advantages of having distinct pass and honours papers, seeing that the distinction is a further source of noncomparability of marks. Admittedly, there is strong evidence that marks are harder to gain on an honours paper, but this merely gives rise to doubts about the justice of equating passes, and failures, obtained on the two. The practice of having all candidates attempt the same questions when content is the same for

all seems preferable. It would be possible to arrange extra questions and extra time for honours students to cover the material special to them. This would establish a common basis against which all students of a particular subject might be assessed and in a single step remove all those sources of noncomparability of marks to which we have referred.

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