

THE IMPACT OF MEASURES TO PROMOTE EQUITY IN THE SECONDARY EDUCATION CERTIFICATE EXAMINATIONS IN MALTA: AN EVALUATION

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Abstract – *When the national Secondary Education Certificate (SEC) examination system was established in Malta in 1994 as an alternative to the General Certificate of Education Ordinary Level (GCE O-Level) offered by English examination boards, the opportunity was taken to promote equity among candidates of different attainment levels, gender and social backgrounds. The measures included the setting of examination papers at different levels; the introduction of an element of school-based assessment in several subjects; relatively low examination fees; avoidance of cultural and gender bias in the examination papers, and restriction of registration to those candidates who were either in the final year of compulsory schooling or aged 16 or over. These measures were expected to attract candidates with a wider range of abilities and social backgrounds than those sitting for the GCE examinations, and to avoid cultural and gender bias. These targets had to be reached against a background of scepticism about the worth, credibility and viability of examinations set by a local examination board when compared to the prestigious GCE examinations set by well-established English examination boards. This paper evaluates the results of the first three years of operation of the SEC examination in order to gauge its impact on equity. The analysis is based on examination statistics, examiners' reports and comments on each of the measures. Access and performance in six major subjects (Maltese, English, Mathematics, Physics, and Italian) are analysed by gender and type of school. Some conclusions are offered about the influence of examinations on promoting equity in an intrinsically inequitable education system.*

Introduction

For over forty years, the external certification of Maltese secondary school students depended almost entirely on examinations set by English examination boards, notably the Oxford Delegacy of Examinations, University of London School Examinations Board and the Associated Examinations Board. In 1987/88, education authorities in Malta decided to phase out the English General Certificate

of Education (GCE) Ordinary- and Advanced-level system and replace it gradually by a locally based system of examinations. The new system was to be built on the foundations of the existing Matriculation system of examinations based at the University of Malta. This decision followed the substitution of GCE O-level with GCSE in Britain as it was realised that the GCSE system would not be suitable for local circumstances (Zammit Mangion, 1992). In particular, GCSE relied heavily on school-based assessment, for which local schools were totally unprepared. Furthermore, its syllabuses were closely connected to the National Curriculum for England and Wales, which differed significantly from the Maltese National Minimum Curriculum that was being developed at the time. Equally important, it was deemed desirable to replace the English GCE A-level system, which led to early narrow focusing on specific fields of study, with an International Baccalaureate-type system, without compromising the opportunity for students to achieve A-level standard in subjects required for further study.

The new system became known as MATSEC (Matriculation and Secondary Education Certificate), with the SEC examinations replacing GCE O-levels and the Matriculation Certificate examination providing the IB-type system instead of GCE A-levels. The innovation was achieved in two stages over a period of eight years between 1988 and 1996. This paper only concerns the Secondary Education Certificate (SEC) system of examinations for 16 year-olds at the end of compulsory schooling, which was developed gradually during the first stage until it became fully operational in 1994. The paper attempts to (a) describe the challenges and opportunities offered by the innovation, with special focus on issues of equity, (b) evaluate the first three years of operation, mainly in order to assess the impact of measures taken to promote equity, and (c) identify patterns and trends that may need to be corrected. For the purposes of this study, equity is understood to cover all stages of the examination: access, the assessment process, the results and their interpretation. This understanding is derived from the analysis of the concept by Gipps and Murphy (1994) who stress that equity is not just equality of opportunity and it is certainly more than equality of outcomes. For them equity 'implies that assessment practice and interpretation of results are fair and just for all groups'.

The context of the innovation

The focus on the change in examination policy may give the impression that assessment emerged as a dominant strategy of educational change, as happened in England in the 1980s (Hargreaves, 1989). In Malta, the innovation served several purposes: political, economic and curricular. In the first place, the setting up of the

new system was essentially a declaration of independence from English GCE examination boards whose syllabuses had practically controlled the secondary school curriculum since 1951. Now, the curriculum fell completely under local control and could be given the direction desired by local educational authorities thus opening new opportunities for educational debate and contestation. In an interview about the new system, the Minister of Education clearly set out the direction that the examinations should take (Cachia, 1991). He suggested that the move away from the GCE examinations, which had become associated with African and Asian countries, should be followed by a move towards a common European examination about which discussions had been taking place within the Erasmus programme. This policy was understandable in the light of Malta's 1989 application to join the European Union. However, the hope of an impending agreement on a common European examination at the secondary school level was clearly misplaced.

Secondly, there was concern about the substantial outflow of foreign currency to pay the GCE examination fees. At the same time, it was realised that many families of capable students could not afford the expensive fees, so that access to foreign examinations depended on family income. A local system of examinations promised to stem the financial drain and become more affordable because it could be administered at a lower cost than a foreign system. Thirdly, the new examination policy was only one aspect of a wide-ranging educational change culminating in the Education Act of 1989 that recast the University of Malta on new foundations, recognised teaching as a profession, and provided for curricula at all levels from kindergarten to post-secondary education. At the secondary level, in particular, the curriculum review made it possible to extend access to the external examination at age 16 to about 80% of the cohort of students and to give some weighting to oral skills in languages and practical skills in some other subjects. There remained, however, the dominance of academic and scholarly knowledge that characterises practically all secondary school subjects (Goodson, 1995). In fact, the National Minimum Curriculum assumed that such knowledge would be suitable for the whole cohort of secondary school students and there was no attempt to strike a balance between academic and scholarly knowledge on one side, and practical and utilitarian knowledge on the other.

Challenges of the innovation

The first challenge of the innovation was to modernise the already existing Matriculation O-level syllabuses in eight subjects that were more suited to local circumstances than the corresponding English GCE examinations. The subjects

included Maltese, Social Studies, Maltese History and Religious Knowledge, which clearly catered for a distinctly Maltese cultural base, and others such as Italian and Arabic, which could reflect better the strong links of Malta and the Maltese language with neighbouring countries and their languages. The examinations in these subjects were already considered equivalent to other GCE subjects for further and higher education. Yet they were in need of modernisation, which actually meant giving the syllabuses a new format with clearly defined objectives, schemes of assessment, content and descriptions of the criteria used for awarding particular grades. The process encountered resistance from practically all the subject committees since their members were unfamiliar with the assessment terms that were used. This led them to think that the suggested changes were unnecessary and would probably lead to a lowering of standards. Eventually, the basic elements of the new structure were accepted, however, the grade criteria, which were meant as an initial move towards criterion referencing, never materialised.

The experience gained in the first step served as a good preparation to meet the challenge of extending the number of subjects offered for examination. In 1990, following pressure by the Ministry of Education to speed up the implementation of the new system, syllabuses for English Language, Mathematics and Physics were drawn up by the two Subject Area Officers for Arts and for Sciences. These were modelled on the corresponding GCE syllabuses used in the schools. With these additions, in 1992 the new system offered all the compulsory subjects - Maltese, English Language, Mathematics, Physics - that were needed for entry to the Upper Lyceum, an academic sixth-form college preparing students for entry to university. The next extension took place under less pressure. Syllabus Panels were set up for twelve new subjects as well as for the subjects already on offer. Wherever possible, each panel had equal representation from the University subject departments and the Ministry of Education, as well as representation from the Private Schools Association. Generally the work proceeded smoothly and produced syllabuses of a fairly standard format, under the direction of the Subject Area Officers, both of whom worked on the innovation on a part-time basis. A third group of subjects was added the next year, so that the full range of twenty-nine SEC subjects were offered for the first time in 1994, two years after the publication of the new syllabuses as required by the regulations. Of course, such an expansion generated a considerable load of administration to cater for the development, approval and publication of the syllabuses, and for the prodigious increase in the number of registrations. Unfortunately, this workload could not be easily absorbed by the purposely set up MATSEC Support Unit because the existing administrative structure for Matriculation examinations was not strengthened in proportion to the increase in commitment, with the result that the administrative staff came under a lot of pressure.

In addition to the administrative constraint, a general air of scepticism accompanied the innovation that increased the stress factor. Schools and the general public aired their concerns through the media, and also some members of the board entrusted with the implementation of the innovation were not sure that it was a wise the decision to substitute foreign examinations with local ones. Doubts were expressed about the credibility of a locally based system of examinations because it was argued that in a small community it was impossible to ensure security and objectivity in marking. Another limitation that was highlighted concerned the availability of expertise in curriculum development and assessment. The innovation entailed a number of tasks such as designing and updating syllabuses, setting and marking of papers, and moderation that needed to be carried out professionally, and it was feared that there were not enough local experts to ensure the quality expected at this level in all subjects. Previously, these tasks had largely been ignored by local educationalists because they were carried out by the English GCE boards. A related issue that was not given much publicity was the question of possible stagnation in the long run. With the GCE examinations, continuous updating was ensured because this happened automatically as soon as the English examination boards changed their syllabuses to address national and international changes in educational thinking. It was not clear how SEC examinations would be updated and how the process of updating would be initiated. Closely linked to the preceding issues was the question of accreditation and international recognition of certification, an issue that featured prominently in public debate. The GCE certificates had world-wide currency and a number of people had used them to join foreign universities and to find employment abroad. With the new system, local examinations would not carry automatic international recognition and it was argued that this would place certificate holders at a disadvantage.

Naturally there were counter arguments and answers to the questions raised but a discussion of them is beyond the scope of this paper. Suffice to note at this stage that all the challenges and the actions taken to meet them were very similar to those encountered in other small states in the Commonwealth who at some stage in their political development decided to set up their own local or regional system of examinations as a substitute for English GCE examinations (Bray and Steward, 1998). In the case of Malta, the challenges were met fairly successfully and after four years in operation one can safely conclude that the innovation has taken root. In the words of an independent observer:

‘Despite the constraints that size imposes, and the apparent lack of alternatives available to small island groups, Malta has succeeded, beyond

the hopes and expectations of many on the island, to set up, a promising and independent examination structure which has set into motion synergies affecting various aspects of the local education system. ... the new examinations have given the policy-makers the opportunity to be more autonomous in establishing an organic and holistic vision for educational practice on the islands; they have encouraged the development of curricula and textbooks that take local culture and realities into account; they have expanded the professional roles of teachers, who are partners in the assessment of their own students; and they are likely to modify the traditional and deeply ingrained pedagogical culture of magisterial lesson delivery' (Sultana, 1996).

Opportunities for equity

The innovation offered an opportunity for setting up an examination system that was more equitable than the existing one. For many years since it was introduced in 1951 (Vassallo, 1955), the GCE system had provided an excellent service to the secondary education level by supplying syllabuses of the proper level, professional assessment, and widely recognised certification. It was also an equitable system as long as secondary education was highly selective, since GCE examinations were meant for the top 20% of the cohort. This was the case until 1970 when secondary education was extended to all pupils and it was decided that the secondary school curriculum should still be regulated by the requirements of the GCE Ordinary-level syllabuses so that nobody would be excluded *a priori* from reaching the required level (Department of Education, 1972). This situation created a lot of difficulties for teachers, who were not used to teaching a highly demanding syllabus to low achievers, and to the students, who were not intellectually prepared for it and lacked the motivation to face the challenging curriculum of secondary education. Unfortunately, the local education authorities had ignored the CSE (Certificate of Secondary Education) system when it was introduced in England in the early 1960s because at that time it was considered unsuitable for high ability students in the secondary schools. The CSE system, which was meant for the next 60% of the cohort, could have provided a good basis on which to design a curriculum for the average and below average students that filled the new secondary schools in 1970. Yet there was no attempt to tap the potential of the CSE system and the secondary school curriculum in Malta remained under the influence of the GCE until the early 1990s.

Accessibility

The new SEC system promised to redress this inequitable situation in two ways: by making the examinations more accessible, and at the same time more valid and equitable. One of the first decisions was that the new examination should cater for about 80% of the population of 16 year-old students in the final year of compulsory education and thus provide them with an opportunity to qualify for post-secondary education. The implementation of this decision had to take into consideration that secondary education in Malta is multipartite and selective, with students in the state sector attending junior lyceums (grammar schools), general secondary schools, and trade schools (vocational schools), and about one-third of the population attending private schools. Examinations were to be offered in twenty nine subjects covering the whole range of subjects (except for craft and trade subjects) taught in the schools. Despite the administrative constraints, the main examination session in May was to be followed by a supplementary session in September in the four compulsory subjects needed to qualify for the sixth-form college. Of course, the great majority of subjects were still to be examined in English as it was tacitly agreed that the language was essential for post-secondary and higher education. Generally, however, the system avoided cultural bias by setting examinations that reflected the local culture and offering subjects that responded to local needs.

As a further incentive and to facilitate access to the examination, fees were set as low as possible and were calculated to enable the Board to break even, in fact they were less than one-third of the GCE examination fees. This action, however, backfired possibly because education in Malta is free at all levels and books are loaned free of charge to all students in all state secondary schools. Following a students' protest in 1994 which received wide publicity in the press, the fees were lowered further and have not changed since then. The introduction of the new system also offered the opportunity to reduce the widespread incidence of private tuition to coach students to pass examinations before they finish the full course of secondary education, which takes five years. It was quite common for students in the fourth year to take private tuition and attempt a number of subjects at GCE level, and it was even more common for fifth year students to attend private lessons so as to sit for GCE examinations at the beginning of their final year at school and again at the end, if necessary. Besides the considerable disruptions in the schools, this practice led to the perception that unless students attended expensive private lessons they did not stand a chance to pass the examination. This perception was one of the reasons that discouraged students who could not afford private tuition from sitting for the examinations. The MATSEC Examinations Board addressed this problem in 1992 when it decided that only students who had

finished their fifth year of studies or who were already sixteen years old are allowed to sit for the SEC examinations. This measure was well-received by the school authorities and in 1995 it was extended by the Ministry of Education to cover GCE examinations as well (Muscat, 1995; *The Times* editorial Feb. 26, 1995).

Validity and reliability

Following the international trend in similar examinations, the SEC adopted the fundamental principle that the examination should enable candidates to demonstrate what they know and can do rather than expose their shortcomings. This philosophy led to the introduction of papers at two levels of difficulty, and candidates being asked to select the appropriate level for their ability in each subject when they register for the examination. With this provision, candidates were required to sit for two papers in each SEC subject: Paper 1 being a core paper containing questions within the ability range of all candidates; then in the case of Paper 2, candidates select between two versions, Paper 2A or Paper 2B. Paper 2A comprises questions that are more demanding than those of Paper 1, and Paper 2B comprises less demanding questions than Paper 1. Clearly, high achievers in the subject were expected to register for Paper 1 and Paper 2A and qualify for Grades 1 (the highest) to 4 that were allocated for that option. While low achievers were expected to sit for Paper 1 and Paper 2B and qualify for Grades 4 to 7. Anybody not reaching the lowest grade allocated to either combination of papers 1 and 2 was to remain unclassified. This arrangement has many positive aspects, not the least of which is that whatever the option that is selected, all candidates could obtain the lowest acceptable grade for entry to the academic sixth-form college, which is Grade 5. On the negative side, conflicting views were expressed from the very beginning about the possibility that some candidates opting for the higher level (that is, sitting for Paper 1 and Paper 2A) fail to obtain Grade 4 and remain unclassified, while their actual achievement could be comparable to the achievement of candidates who obtain Grade 5 by taking Paper 1 and Paper 2B.

Besides written papers, the SEC syllabuses in all languages introduced an oral and aural component that accounts for about 20% of the global mark of the examination. In the case of another ten subjects, such as Business Studies, Computer Studies, Environmental Studies, Geography, and the sciences, marks given by the teachers for coursework, including project work, fieldwork, and practical work, contribute 15% to the global mark. These innovations enhance the validity of the examination because they assess skills that cannot really be assessed by written papers. They also contribute to the diffusion of teaching methods that promote educationally valuable skills in research, problem-solving

and communication. It is common experience, however, that coursework can be copied and school-based assessments introduce an element of unreliability in marking even in countries where teachers have been purposely trained to use well-defined criteria to make a fair assessment. For this reason, the contribution of school-based assessment has been kept as low as 15% in all subjects. This solution may seem quite reasonable except that the inclusion of coursework assessment also entails a substantial amount of moderation and administration by the Board. This raises the criticism that the administrative 'cost' is too high for such a low contribution to the final grade, forgetting that coursework has other educational benefits that cannot be easily quantified.

Research questions

The foregoing measures have been in operation for three full years, and it is now proper to start evaluating their impact, exploring whether they have achieved the desired aims, and whether they need to be modified to avoid any unintended outcomes. With these purposes in mind, the following research questions have been formulated keeping in mind equity through accessibility, validity and reliability:

- Has the number of candidates sitting for the SEC examination increased over the last three years? Has it reached the desired 80% of the cohort?
- Have the proportions of candidates from Junior Lyceums, General Secondary Schools, Trade Schools and Private Schools changed in favour of the weaker candidates?
- Is the system of differentiated papers 2A and 2B achieving its aim of offering the opportunity to candidates of different attainment levels to show what they know and can do?
- Has the provision for school-based assessment improved teaching and learning, and how reliable is it?
- Do the examination results reflect an equitable examination? In particular, are there significant differences in achievement between boys and girls, and candidates from the state and private sectors?

Method

Answers to the research questions have been obtained by analysing a selection of data collected and published by the MATSEC Support Unit. These include data from registrations, examination results, and Markers' panels reports of at least the

first three years of operation. Only the six subjects for which there were the highest registrations are considered here. These comprise Maltese, English Language, Mathematics and Physics, which are core subjects for all secondary school students, as well as Religious Knowledge and Italian, which are the most popular optional subjects among candidates.

Registrations

The number of registrations for the six subjects can be taken as a global measure of the accessibility of the SEC examinations. In this case, it is possible to consider registrations for the main May session of examinations of five years, starting from 1993, when the full range of subjects and scheme of assessment was not yet in operation; up to 1997. The data is plotted in two graphs. Figure 1 shows registrations for Maltese, Religious Knowledge and Italian, which had been offered for many years as matriculation subjects and had replaced the corresponding GCE examinations as far back as 1975. Figure 2 shows registrations for the new SEC subjects English Language, Mathematics and Physics, which the candidates could still take separately as GCE examinations. The total number of 16-year-olds recorded in the *Demographic Review of the Maltese Islands* (Central Office of Statistics) for the respective years is also included in both graphs for comparison.

FIGURE 1: Number of candidates registering for SEC Maltese, Religious Knowledge and Italian for the years 1993 to 1997

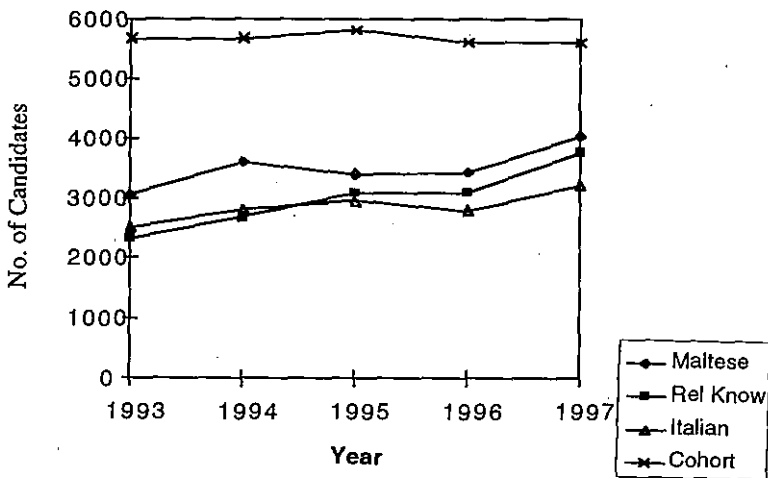
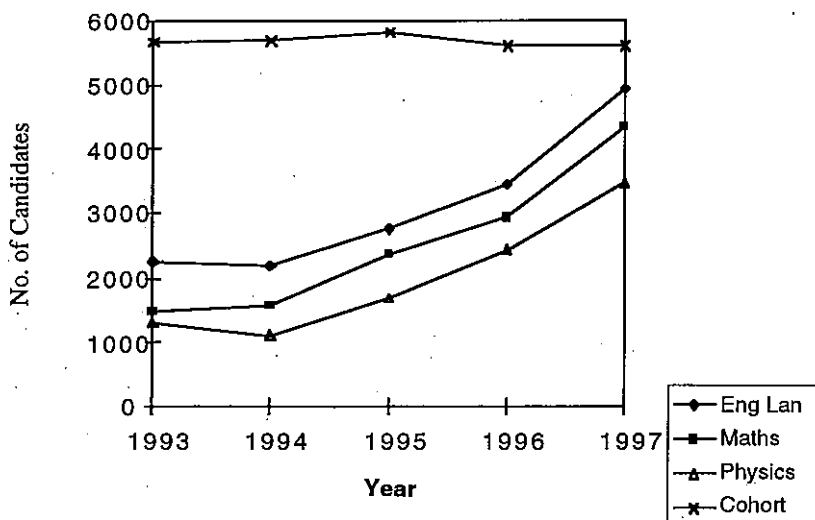


FIGURE 2: Number of candidates registering for SEC English Language, Mathematics and Physics for years 1993 to 1997



Both graphs indicate an increase in the number of registrations, but as expected the growth in the established subjects was smaller because these subjects already catered for a high proportion of secondary school students (Figure 1). In fact, in the case of Maltese, 53.9% of 16-year-olds sat for the subject in 1993 and this increased to 72.2% in 1997. The new subjects (Figure 2) showed a more rapid growth with English Language catering for 39.8% of the population in 1993 to 88.1% of the population in 1997, Mathematics from 26.0% in 1993 to 77.3% in 1997, and Physics from 23.0% in 1993 to 61.9% in 1997.

There may be several explanations for this general growth in the number of registrations in all subjects. One reason, is that more students of a wide range of abilities are becoming interested in obtaining certification which they need for further education and for employment, and the SEC examinations are seen as a challenge which they can face with some confidence. Certainly, however, the standard of the examinations is not lower than that of the GCE examinations, as can be seen from the low pass rates in some subjects. But the fact that students can sit for either Paper 2A or Paper 2B could be encouraging students to attempt the examination. Previously they would have given up studying because they would

have been discouraged by the prospect of sitting for the same paper as students of high academic ability. The remarkable increase in the registrations for the new subjects must also be due to the fact that they have gained credibility and trust, and are now seen as a valid substitute for the GCE examinations. Of course, some of the growth in these subjects may be due to re-sits after a year, especially in subjects such as English for which the failure rate is very high. This means that the figures of registration given as percentages of the population are an over-estimate. Keeping this in mind, it is quite clear that the target of 80% of the population sitting for the examination has not yet been reached, at least in the core subjects and it would be useful to investigate whether the shortfall depends on factors such as gender and type of school.

TABLE 1: Average percentage of candidates by type of school for 1994-1997

	Maltese	Eng. Lang.	Mathematics	Physics
Junior Lyceums	47.6	42.6	42.9	51.9
General Secondary	10.5	15.8	13.3	6.4
Trade Schools	2.3	4.0	2.5	0.7
Private Schools	39.7	37.5	41.4	40.9

Taking the number of candidates from the secondary schools and excluding those from post-secondary schools and private candidates, most of whom would be re-sitting the examination, two factors emerge quite clearly and consistently for all the six subjects being considered and for the successive years 1994 to 1997. Firstly, as a general rule more girls than boys sit for the examinations, except for English Language, Mathematics and Physics in May 1996 where, in the population of 16-year-olds, the numbers were almost equal with a slight predominance of boys. Secondly, the number of candidates from the General Secondary schools is small and that from Trade Schools is minimal. This can be deduced from a comparison of the average percentages of the total number of candidates from secondary schools during the period 1994-1996 for the core subjects given in Table 1, and the percentages of 16-year-olds during the same period obtained from published sources that show 53.8% attending junior lyceums and general secondary schools, 16.3% attending trade schools, and 29.9% attending private schools.

The shortfall of candidates from particular types of schools needs to be addressed in order to make the SEC examination more equitable. Action is needed especially in the case of boys from General Secondary schools and students from Trade Schools. Of course, a technical solution can be and should be found for offering a fair and impartial assessment for these students, however, it must not distract attention from wider equity issues, such as equality of access to learning, 'biased' curricula and inhibiting classroom practices. The recent curriculum reform of the Trade Schools promises equality of educational opportunities for students attending these schools (Department of Education, 1993). Its effect should appear in a few years time when the percentage of candidates from Trade Schools is expected to increase.

Differentiation

One of the major innovations of the SEC examinations was the introduction of differentiation between papers in all subjects such that the combination of Paper 1 and Paper 2A was designed for the high achievers and the combination Paper 1 and Paper 2B for the low achievers. This structure emerged from the application of the fundamental principle that the examination should be an opportunity for candidates to show what they know and can do. With differentiated papers, high achievers would concentrate their efforts on the more challenging questions without having to spend time on less demanding ones, while the low achievers would be faced with questions which are still demanding at their level but not so difficult as to discourage them. In other words the system sought to elicit the maximum effort from candidates without distracting them with questions that were either too simple or too difficult for them.

Grading candidates sitting for different papers

This new system raised two important issues and introduced a degree of uncertainty in its operation. The first issue concerns the problem of establishing an equitable procedure for awarding Grade 4, which can be obtained by candidates sitting for different papers. At least two solutions are possible. One is to set out clear criteria for the award of Grade 4 for each subject and applying them uniformly to the performance of candidates, whether they sit for Paper 1 and Paper 2A or Paper 1 and paper 2B. The other solution is a quantitative one which involves a statistical analysis of performance. All candidates are graded provisionally according to the marks obtained in Paper 1, which is common to both options. Then, the average marks of the provisional Grade 4 candidates

in Paper 2A or Paper 2B are added to the range of marks obtained from Paper 1 in order to arrive at ranges of global marks for which a Grade 4 is finally awarded. The second solution is the one that has been adopted by the SEC examination so far.

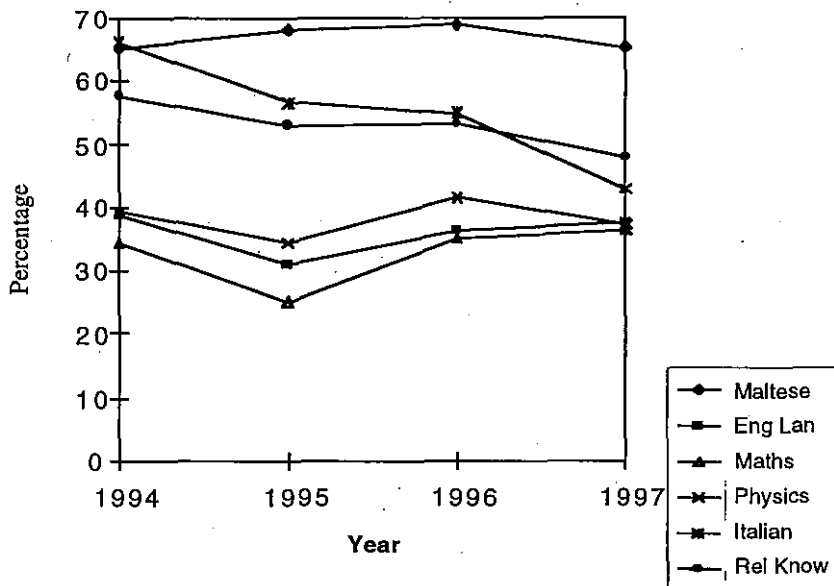
Selecting Paper 2

The second, more important issue concerns how candidates choose Paper 2A or Paper 2B and who should advise them which paper to choose. Naturally, candidates and their parents expect advice and guidance from the teachers, for whom the conditions of the examination are also new. Teachers are generally reluctant to give a clear-cut advice, however, especially because registration takes place about five months before the actual examination. They argue that even though past performance in tests and examinations could give a clear indication as to which option would be more suitable for an individual candidate, the crucial period of preparation between registration and examination has a decisive effect on the candidate's performance, and as it is not possible to predict the effect, it would be inopportune to advise about the choice of Paper 2A or 2B. Despite these objections, some schools decide for their students by advising them to register for a particular option either because they think that the reputation of the school could suffer a loss of status or because they have a clear idea of their students' potential. Either way, it is not certain that candidates choose the option that matches their ability in the subject. Moreover, some high achievers may deliberately decide to take the 'easy' route, study less and be content with Grade 4 or Grade 5. By abusing the system in this way, they may be blocking the middle grades and effectively reducing the chances of average candidates from obtaining a Grade 5. This behaviour creates an unfair situation that defeats the whole purpose of differentiated papers. There is also the possibility that candidates' selection of option is based on their self-esteem, which depends on psychological and social factors.

Trends in the choice of Paper 2A and Paper 2B

With these considerations in mind, an analysis of the available data can be carried out in order to find out whether the system of differentiated papers is actually offering candidates of different abilities the opportunity to show what they know and can do as intended. During the years 1994 to 1997, the registrations of candidates for the long established subjects SEC Maltese, Religious Knowledge, and Italian show a different trend from that of the new subjects English Language, Mathematics and Physics (Figure 3).

FIGURE 3: Percentage of candidates opting for Paper 2A in SEC Maltese, English Language, Mathematics, Physics, Italian and Religious Knowledge



The trends show that in SEC Maltese, every year about two thirds of the candidates (67% on average) register for Paper 2A, the difficult paper. In Italian, registrations for Paper 2A dropped from 66.2% in 1994, to an average of 56% in 1995 and 1996, to a low of 42.8% in 1997. The same downward trend is observed for Religious Knowledge as registrations for Paper 2A fell from a clear majority of approximately 58% in 1994, to about 53% in 1995 and 1996, down to a minority of 48% in 1997. In the new subjects, a minority of candidates register for Paper 2A in all subjects and the proportion of candidates is fairly constant, about 37.6% in English Language, 35.2% in Mathematics, and 39.4% in Physics, except for 1995 when these values were all less by an average of 7%.

There may be several explanations for the observed trends. One interpretation is that candidates for the new subjects realised from the very beginning that Paper 2A is meant for high achievers and only between 35% and 40% believed that they can obtain at least Grade 4 in English Language, Mathematics, and Physics. Candidates sitting for Italian and Religious Knowledge are also becoming used to the idea that Paper 2A is meant for high achievers, and that average ability candidates stand a better chance of obtaining a useful grade for further education

by sitting for Paper 2B instead. This realisation has probably been brought about by a simple analysis of the published examination results. The majority of candidates sitting for Maltese persisted in believing in their ability to obtain a good grade by sitting for the difficult paper. Of course, this belief is also based on the perception of difficulty of the various subjects, which is gained during the course of studies at school and reinforced by the actual performance in the examination.

Another interpretation is that quite a few high achievers are opting for Paper 2B, the easy paper, because they do not want to take the risk of remaining unclassified if they happen to perform badly on Paper 2A. This interpretation is particularly applicable to the decreasing trends observed in Italian and Religious Knowledge, especially as these subjects are not offered in the supplementary session in September. For these subjects, a failure in the May examination can only be remedied by re-sitting the examination a year later. The same interpretation can be applied to the new subjects, as high achievers may be 'playing safe' by opting for Paper 2B. In the case of these subjects, there is no definite trend in the choice of papers. More importantly, however, there is no indication of the proportion of candidates one would expect to sit for the difficult paper. There is therefore no way of assessing whether there is a shortfall of candidates sitting for Paper 2A in any of the subjects just by analysing registrations. An estimate of the proportion of candidates one would expect to sit for Paper 2A can be obtained *a posteriori* by an analysis of the raw scores obtained by candidates in Paper 1 (the core paper) and comparing it with their scores in Paper 2A or 2B. This analysis would show up not just the shortfall, if any exists, but also whether each individual candidate made a wise option of Paper 2. Such a statistical analysis has not yet been undertaken but the Markers' panels have expressed their opinions about the issue in the reports they submit after each examination session.

Markers panels opinions about differentiation

When the choice of Paper 2 was first offered in 1994, the Mathematics report commented that 'the restructuring of the examination (Paper 2A and Paper 2B) did not have any ill-effects on the registration and the candidates' performance'. Furthermore 'the 32.8% opting for Paper 2A was in the right direction'. The English Language panel estimated that 'about 10% who took Paper 2B would have performed equally well had they selected [the more difficult] Paper 2A', but 'by and large, candidates made the right choice [of Paper 2]'. The Physics panel were not so optimistic as they reported that 'a significant number of students did not make the right choice of Paper 2A and 2B'. Similarly, and more vehemently, the Italian panel remarked that on account of the 'illogical division of Paper 2 into two

alternatives', they experienced 'the unfairness of seeing 158 candidates who opted for Paper 2A and failed to get a Grade 4 going Unclassified when their level was equal to those who got a grade 5 the previous year', and 'actually those who have been deprived of Grade 5 in Paper 2A are not inferior to those who have obtained Grade 5 through Paper 2B'. They thought that this was 'a gross injustice and the candidates and their parents would be furious if they knew about it'. They also called for an immediate remedy by means of a revision of the grading system.

A year later, in 1995, when on average the proportion of candidates opting for Paper 2A dropped by about 7% in five of the six subjects, the Markers' panels commented favourably on this development. The Physics panel remarked that 'candidates acted more wisely in the choice of paper in this session'. A similar comment was made by the Italian panel though they added that 'there will always be borderline [candidates] who could just make it or not'. The English Language panel noted that 'In Paper 2A, 81.3% obtained a grade between 1 and 4 within a fairly normal distribution curve, indicating that the candidates, on the whole made the right choice of paper'. This result is remarkable when one considers that only 35.7% of all candidates managed to obtain a grade between 1 and 5. Yet the panel went on to remark that on closer scrutiny it appears that 'relatively good' candidates are probably 'playing safe' - that is they are choosing 2B as the easier paper and settling for a Grade 4 in this paper rather than attempting to get a better grading on 2A ... One noticeable effect of having potential '2A' candidates sitting for the 2B paper [is] that the grading scheme for the 2B paper had to be pushed somewhat on the 'high side' - thus minimising, to some extent, the chances of real 2B candidates of obtaining better results, or, at least, results which adequately reflect their performance.'

In the next session of examinations, it was the turn of the Markers' panel of Religious Knowledge to hint at the same inequitable situation when they remarked that 'a good number of candidates who obtained Grade 4 in Paper 2B could have made at least the same grade in Paper 2A'. Also in 1996, the panel for Italian was still worried that about 100 candidates out of those who opted for Paper 2A and remained unclassified could have qualified for a Grade 5 were it possible for the panel to award that grade.

The analysis of the data and markers' comments about differentiation between candidates by means of two versions of Paper 2 show that:

(i) the pattern of choice is stable in the case of Maltese and the new subjects English Language, Mathematics, and Physics, while candidates are still adjusting to the new system in Italian and Religious Knowledge;

(ii) markers complain that the system is not equitable for some candidates opting for Paper 2A who remain unclassified even though they deserve Grade 5;

(iii) markers also complain that the system is also not equitable for a number of candidates opting for Paper 2B who are 'pushed out' of Grade 5 by other candidates who are 'playing safe'.

Assessment by teachers

Oral and aural examinations

One of the aims of introducing oral and aural examinations in all language examinations was to emphasise the communicative nature of language by highlighting the importance of listening and speaking skills and showing that they deserve to be assessed as much as reading and writing. Before the SEC examinations, oral tests were held in foreign languages only but now they have been introduced in Maltese and English as well. Generally, the assessment consists of a part which is marked by the Markers' Panel and another assessed by class teachers recruited by the MATSEC Board to conduct the examination. This system facilitates moderation since the marks obtained by individual candidates in the two parts can be compared and moderated as necessary.

Reports by the Markers' Panels show that generally the aims are being reached, though it has been noted that the class teachers tend to give inflated marks for reading and conversation skills, which they assess. Some extracts from these reports support this general conclusion. In the 1994 SEC English Language examination, candidates obtained a median score of about 12 marks of 15 in listening comprehension, which was an exercise in which all papers monitored and moderated. In picture interpretation and role play, candidates obtained between 5 and 7 marks out of 10, although some only managed to obtain 2 or 3 marks, indicating a deficiency in oral production. In 1995, in the same subject, the Markers Panel noted that by and large class teachers performed their assessment with credit, yet there was a discrepancy between marks given by the official markers for listening comprehension and the marks for picture interpretation and role play given by teachers. The latter tended to give higher marks. Overall, the results in English Language showed that some 80% of the 16 year olds who sat the examination could understand and speak English without any serious breakdown in communication.

A similar situation was noted by the Markers' panel for SEC Italian. Their report for the May 1995 examination explained that the listening comprehension exercise was less easy than previous years because candidates had shown that they were capable of tackling stiffer material. Few candidates obtained less than 5 out of 10, but the overall score showed that some of the teachers involved in the

assessment were too lenient in marking the reading and conversation tests. This observation was followed with the valid suggestion that teachers needed more training to help them to apply criteria that reflect the expected levels of attainment.

School-based assessment of projects, fieldwork and practical work

The introduction of school-based assessment in the SEC examinations was a complete departure from GCE examinations, which were based solely on written papers. Considering that a few years previously, GCSE examinations were rejected mainly because they incorporated a substantial element of school-based assessment, the innovation did not encounter any serious objections. Headteachers and teachers accepted the change and expressed their agreement with it when members of the MATSEC Board visited schools. They felt that the element of practical and project made a valid contribution to learning, and the extent of its contribution to the final mark (i.e. 15%) was prudent. Some schools with poor laboratory facilities immediately took action to upgrade their facilities. Other schools which did not have laboratories took action to provide decent facilities for their students without complaining. There was, however, a negative reaction from the Malta Union of Teachers (MUT) which could have wrecked the new examination system. In March 1993, the MUT noted that the changes were made without consultation and agreement with it and without proper preparation of the teachers. Moreover, the union argued that teachers in state schools were being asked to do extra work which was not part of their normal duties. For these reasons, the union warned teachers not to tackle any work connected with MATSEC examinations before there was agreement between the University, the Department of Education and the Union (MUT, 1993). The agreement was reached in November 1994 when it was decided to consider the assessment of projects and practical work as part of normal school work. As a consequence of this decision, it was agreed to exclude set practicals and reference to criteria for assessing the work from the published syllabuses since the schools would be responsible for them. Teacher Assessed Practical Score (TAPS) forms that recorded the marks for work carried out by the pupils, which were meant to be signed by the teachers and stamped by the school were also to be withdrawn. Following this agreement, schools sent in their marks and members of the Markers Panels visited the schools about four weeks before the SEC examination to moderate the candidates' work. This system has worked without serious hitches since 1995.

The results of the school-based assessment show that most of the marks fall in the range 12 to 14 out of a maximum 15 marks. There are, however, differences between schools regarding the level of the practical work that is set and the quality

expected. Clearly, school-based assessment is an area which requires further development in order to ensure that the educational benefit derived from the active participation of students in learning is not marred by inconsistent standards and unreliable marking. Some of the issues that need to be addressed include clarification of criteria for assessing and marking the work, professional development of teachers as assessors, and a definition of the role of moderators and their interaction with teachers. In particular, it should be widely recognised that 'moderation depends on the achievement, by discussion and negotiation within a group, of a socially constructed consensus about how work is to be valued and criteria interpreted' (Radnor and Shaw, 1995). The MATSEC Support Unit then has to act accordingly by organising activities during which discussion and negotiation can take place. In this way, the moderation process will not remain a one-off, end-of-year judgement but develop into a dialogue between moderators and teachers. Besides promoting equity and reliability, this process should lead to teacher development with a backwash effect on teaching (Harlen, 1994).

The candidates' performance

Equity in the examination presumes that there is no discrimination among candidates except on the basis of merit. In particular, there should not be any differentiation on the basis of personal attributes (e.g. sex, colour, ethnic background), religious belief or social class. In Malta, there are practically no differences in colour, ethnic background and religious belief, but it is important to assess whether the SEC examinations are producing unexpected differences in performance by gender and provenance from different types of school. Gender differences in various subjects can be compared with results from international studies (for example Keeves, 1992) and local research. The analysis of any differences on the basis of provenance takes into account candidates from state schools and others from private schools. This analysis must bear in mind that both sectors include schools that accept only students who pass a selective examination at the age of 11+. The state sector also includes schools for candidates who do not pass the selective examination, and the private sector also has schools for students who need not sit for an 11+ examination. Generally, there is also a difference in social class between students in the different sectors, with students in private schools coming from a higher social class.

The analysis is based on the published results, which are given as Grades 1 to 7 or Unclassified, and not on the actual marks obtained in the examination. For the purpose of computation, grades are translated into points, with 7 points for Grade 1, 6 points for Grade 2, and so on, while Unclassified is considered as zero points.

TABLE 2: Examination Results by Gender

		Male			Female			
		1994	1995	1996	1994	1995	1996	
Maltese	X	3.407	3.827	3.330	X	3.930	4.280	4.027
	SD	1.980	1.770	1.849	SD	1.767	1.517	1.641
	N	1247	1380	1422	N	1583	1700	1713
					***	***	***	
English	X	2.530	2.233	2.170	X	2.394	2.627	2.439
	SD	2.077	1.977	2.170	SD	1.987	2.175	2.240
	N	607	837	1232	N	803	975	1284
						***	**	
Maths	X	3.033	2.952	3.694	X	2.688	2.545	3.252
	SD	2.101	1.854	1.861	SD	1.706	1.712	1.838
	N	426	693	1163	N	504	774	1138
		**	***	***				
Physics	X	2.456	2.722	2.913	X	2.896	2.638	2.839
	SD	2.041	1.905	1.787	SD	1.867	1.898	1.739
	N	340	587	1056	N	347	638	1037
					**			
Italian	X	3.472	3.579	3.492	X	3.351	3.448	3.196
	SD	2.249	2.047	2.120	SD	2.250	2.148	2.022
	N	996	1075	1107	N	1245	1295	1261

Rel Know	X	3.121	3.642	3.243	X	3.132	3.480	3.623
	SD	2.026	1.986	2.107	SD	1.895	2.015	2.047
	N	902	1094	1162	N	1294	1479	1559
		*					***	

NOTES:

1. X = Mean Score, SD = Standard Deviation, N = Number of candidates
2. Only the results of t-tests for differences between mean scores which reach statistical significance are recorded. The significance is indicated by means of asterisks underneath the group with the higher mean score, such that $p < 0.05$ is denoted as *, $p < 0.01$ as **, and $p < 0.001$ as ***.

TABLE 3: Examination Results by School Sector

		State				Private		
		1994	1995	1996		1994	1995	1996
Maltese	X	3.553	3.864	3.614	X	3.925	4.390	3.853
	SD	1.911	1.606	1.813	SD	1.815	1.666	1.703
	N	1716	1835	1865	N	1114	1245	1270
					***	***	***	
English	X	1.968	1.993	1.742	X	3.452	3.131	3.135
	SD	1.712	1.854	2.000	SD	2.250	2.247	2.243
	N	950	1084	1495	N	460	710	1021
					***	***	***	
Maths	X	2.608	2.472	3.048	X	3.218	3.104	3.970
	SD	1.761	1.629	1.633	SD	2.056	1.937	1.986
	N	567	851	1234	N	363	616	1067
					***	***	***	
Physics	X	2.595	2.377	2.577	X	2.843	3.078	3.213
	SD	1.887	1.802	1.556	SD	2.109	1.956	1.916
	N	457	698	1108	N	230	527	985
						***	***	
Italian	X	2.876	3.109	2.915	X	4.021	3.912	3.745
	SD	2.193	2.043	1.889	SD	2.157	2.088	2.162
	N	1206	1194	1171	N	1035	1176	1197
					***	***	***	
Rel Know	X	2.941	3.365	3.128	X	3.378	3.797	3.936
	SD	1.866	1.903	2.058	SD	2.031	2.108	2.022
	N	1260	1477	1600	N	936	1096	1121
					***	***	***	

NOTES:

1. X = Mean Score, SD = Standard Deviation, N = Number of candidates
2. Only the results of t-tests for differences between mean scores which reach statistical significance are recorded. The significance is indicated by means of asterisks underneath the group with the higher mean score, such that $p < 0.05$ is denoted as *, $p < 0.01$ as **, and $p < 0.001$ as ***.

The mean scores and standard deviations in the six subjects under consideration for 1994 to 1996 are presented in two tables. Table 2 presents results by gender and Table 3 shows results by school sector. Differences between groups are investigated for statistical significance by means of t-tests. When significant differences emerge, they are indicated in the tables by means of asterisks placed under the groups that have the highest mean score. The analysis also includes a two-way analysis of variance to determine the strength of the effects of gender and school sector and any interaction effects between the two variables (Table 4).

Gender differences

The results in Table 2 show that there are gender differences in examination performance in all subjects. Some differences are consistent and follow the expected trends, others are either sporadic or run counter to international trends. The significant differences in Maltese and English are always in favour of girls, which agree with international trends that show the girls' superiority in verbal abilities. However, in a study of scholastic achievement of Maltese secondary school students in the first three years of state junior lyceums (grammar schools), Borg (1996) only found a significant difference in favour of girls in Maltese but no difference in English by the end of the third year. In SEC Mathematics the differences are undoubtedly in favour of boys, again in general agreement with international trends. This result is also in contrast with that obtained by Borg (1996). This is not surprising since his sample consisted of younger students in state schools only. In Physics, Italian and Religious Knowledge there are only sporadic differences, so a reasonable conclusion would be that there are no consistent gender differences in the subjects. The result in Physics runs counter to general international trends but is in agreement with local results (Borg, 1996; Ventura, 1992). These have shown that since the early 1980s, when Physics became a compulsory subject, the performance of girls was not very different from that of boys with a slight difference in favour of boys in the pass rate at GCE O-level. With the SEC Physics examination, girls have managed to close the gap.

Differences by school sector

The differences by school sector are consistent and decidedly in favour of candidates from private schools in all subjects. The results of the two-way analysis of variance (Table 4) confirm that the main effect contributing for differences between groups of candidates is due to school sector and not to gender differences.

Various explanations may be given for these differences, but these can only be hypotheses which need further investigation. An important factor that could account for the differences is that the populations of private schools and state schools are different as regards ability, motivation, resources at school, and support from the home environment. Another factor may be that private school candidates are better coached for the examination at school and with the help of private tuition. A third factor could be that more private school candidates sit for Paper 2A and consequently obtain better grades, which then boost their mean score. Conversely, there may be equally able state school candidates who prefer to 'play safe' and sit for Paper 2B, which enables them only to obtain Grade 4 at best, thus lowering their mean score. Differences in self-esteem and expectations may be driving candidates to register for the paper which is not matched to their ability in the subject. The strength of these factors need to be investigated before one concludes that the examination is favouring candidates from private schools. An understanding of the factors allows the examination system to take action to alleviate the inequitable situation already prevailing in the schools, but it cannot eliminate it.

Towards equity

The search for equity in educational assessment procedures is complex and at times elusive. The preceding account of the development and work of MATSEC raises very many dimensions of the equity in assessment debate. Although this case study explores in some detail developments within the unique context of this small state, there is much that can be derived from it and applied to other contexts. In conclusion, it is therefore appropriate to highlight the equity issues, which have been discussed in this historical and analytical account of MATSEC's activities to date.

The study shows that difficulties exist in addressing fairly the local needs, context, and knowledge of students through large scale systems of assessment. In this case these have been countered by the creation of a local examination board whose prime mission is to provide syllabuses and examinations with high local validity and relevance. The new examinations move away from an 'elite assessment system' towards one that attempts to offer access, relevance and appropriate assessments to the wide range of students studying within the local context. Linked to access is the question of the cost of assessment, which in this case has been kept as low as possible in order to prevent discrimination on the grounds of wealth and poverty. Alongside the concerns of access to the assessments, the study also considered issues related to the access that the

TABLE 4: Two-way Analysis of Variance by Gender and School Sector of Examination Results in SEC Subjects for 1994-1996

Subject		Gender Effect		School Effect		Gender X School Eff.	
		F value	signif.	F value	signif.	F value	signif
Maltese	'94	55.874	***	56.836	***	0.864	n.s.
	'95	60.933	***	128.668	***	1.106	n.s.
	'96	127.959	***	47.094	***	27.118	***
English	'94	1.799	n.s.	190.392	***	7.949	**
	'95	17.445	***	165.947	***	5.230	n.s.
	'96	10.558	***	312.197	***	3.521	n.s.
Maths	'94	7.743	**	18.531	***	0.002	n.s.
	'95	19.560	***	35.506	***	0.497	n.s.
	'96	34.768	***	126.008	***	13.417	***
Physics	'94	8.768	**	6.018	*	0.427	n.s.
	'95	0.622	n.s.	41.950	***	0.680	n.s.
	'96	0.949	n.s.	70.445	***	0.007	n.s.
Italian	'94	1.711	n.s.	157.540	***	3.155	n.s.
	'95	2.354	n.s.	88.508	***	0.750	n.s.
	'96	13.692	***	83.566	***	1.049	n.s.
Rel Know	'94	0.018	n.s.	30.318	***	10.474	***
	'95	4.137	*	25.893	***	2.287	n.s.
	'96	23.595	***	144.969	***	2.786	n.s.

The significance of the F-values is indicated by means of asterisks, such that <0.05 is denoted as *, $p<0.001$ as **, $p<0.001$ as ***, and non-significant values are noted as n.s.

qualifications may give to further educational and employment opportunities. The world-wide currency of examination results represents another equity issue.

Students can be disadvantaged in examinations by not being clear enough about what they need to do to succeed. In this case, steps were taken to make the assessment objectives and standards clear to potential candidates. In local examinations, students can be discriminated against by examiners, who may know them or their schools and colleges personally. Fairness in marking and grading is another highly important equity issue addressed in this case. Finally, the study shows that examinations can focus upon a narrow range of achievements, disadvantaging students whose main achievements lie outside this range. The provision of coursework opportunities and alternative assessment methods have been considered as an approach to modifying the discriminatory effects of examinations.

MATSEC's history has been a short one, when compared to many national examination boards. It is clear, however, that much has been learned and achieved, not least in relation to addressing the question of equity in assessment.

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