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Royal Society Comments on the Review of 16-19 Education by Sir Ron Dearing

Summary

The Society supports many of the final recommendations of the 16-19 Review, although we have reservations regarding some of the key reforms proposed. We support the proposal to develop more clearly four national levels of achievement, although we find the notion of rigid boundaries between different types of qualification to be unhelpful. We are not convinced of the need for the proposed National Certificate, but we fully support the development of the National Diploma to recognize breadth and depth of studies. However, we see a considerable barrier to the widespread adoption of the proposed National Diploma as it is currently proposed. To resolve this, the Society would prefer to see a more flexible set of criteria for its award.

We welcome the emphasis on key skills; where possible these should be developed in the context of other subjects. We are not convinced that a separate grading concerned with calculation, estimation and statistics on GCSE mathematics certificates is necessary or desirable, nor are we convinced that schools should encourage prospective A level mathematics students to take an additional GCSE paper in mathematics. Our preference is for a clearer focus on a smaller body of fundamental mathematical skills rather than a broad acquaintance with a range of them.

We strongly support the recommendations for a reformulated AS level. These and other changes will lead to a more flexible system of A and AS levels. We firmly support such flexibility. We believe that it is important that there is a 'level playing field' in terms of subject difficulty at A level. We are in favour of the regulatory bodies continuing to collect evidence to establish whether the current range of GCSE courses in science provides sufficient preparation for further study at A level. We reaffirm our support for the great majority of students using 20% of their curriculum time at 14-16 on the study of science. We support further consideration of the content of A levels in mathematics and science, including where necessary increasing the size of the mandatory cores in these subjects.

Introduction

The Royal Society has a long-standing interest in 16-19 education, publishing views on this phase of education in 1988 (*The 16-19 Science Curriculum: Statement of Policy*) and 1991 (*Beyond GCSE*). The Society was pleased to be consulted on a range of issues during the review of 16-19 education conducted by Sir Ron Dearing.

The final report by Sir Ron Dearing is a comprehensive review of 16-19 education, with 198 specific recommendations across 14 aspects of provision. We are pleased

that, within the narrow terms of reference given to Sir Ron, many of the Society's concerns have been addressed. We are able to support many of the final recommendations, although we have reservations regarding some of the key reforms proposed. We believe that some of the recommendations are in tension with each other, and that this will need to be resolved through consultation.

The following commentary relates to the recommendations outlined in the final report (these are noted in brackets). Some aspects of the review, although important, are outside the Society's direct area of interest or expertise and we do not comment on them.

A national framework of qualifications

We support the proposal to develop more clearly four national levels of achievement (recommendation 1). These will assist with student retention rates particularly through the introduction of the Entry Level qualifications, and will provide for more 'life-long' learning opportunities. We note, however, the position of the proposed AS examination which seems to sit between Intermediate and Advanced level. Following from this recommendation, we support proposals (2-5) to ensure greater clarity of these national levels which will provide greater transparency to an otherwise complex system.

We find the notion of rigid boundaries between different types of qualification (6) to be unhelpful, not least because it infers that students need one or another type of education. We believe a single qualification system preferable, with a range of different purposes, from developing a theoretical understanding through to the application of specific relevant skills. Different styles of learning and assessment would then reflect this range. However, we recognise that within the constraints of the present system the divisions between qualifications cannot (yet) be removed.

We are pleased to note that the review (7) recognizes that GCSE examinations develop general education as well as applied skills. It therefore supports both the A level and GNVQ routes. We would not wish to see the artificial nature of the divide between qualification pathways further emphasized by the allocation of subject areas to specific pathways (7). There will be many subjects, the sciences for example, which need both theoretical and applied knowledge to be developed, and will therefore need to be available in all pathways.

We support the further consideration of a national subject framework for qualifications based on coherent groupings (10). We would wish to see further work by examining bodies to identify common content in modular A levels and GNVQs (11), continuing the work undertaken by the Gatsby Project during the Review. It will be helpful for centres to know this common material. We would urge caution, however; this analysis should not drive curriculum choice and planning, but should follow it.

We support proposals to ensure a common quality assurance system (12-16). This will be important in making clear that similar levels of award across the qualification framework make equal demands on students.

The regulatory and awarding bodies

We welcome recent developments which have brought together awarding bodies to create joint arrangements for A level and GNVQ. We support the recommendation

that this should be encouraged further (21). We also support the recommendation that action is taken to rationalise the number of bodies involved in awarding qualifications (22).

We support bringing together the work of SCAA and NCVQ into a single statutory body (24). We would urge caution however with regard to the position of NVQs, and welcome further consultation on how best to ensure that they continue to be based on occupational standards (25).

In other areas of the Review great efforts have been made to reduce complexity and to ensure greater understanding of 16-19 education. We consider that proposals for the regulatory and awarding bodies in Wales and Northern Ireland (26-32) do little to promote this theme.

Youth training and Modern Apprenticeships

We broadly support the recommendations on the further development of apprenticeships and related training opportunities (33-51). Much of this work is concerned with employment in scientific and technological fields. It is essential that there is a healthy supply of well-qualified individuals to support organisations engaged in scientific or technological enterprise.

The National Record of Achievement

We welcome the further development of the NRA (52-60), including its extension to Year 9 students, particularly those aspects which develop and recognise careers guidance. The resource implications are significant. For careers education and guidance to play a full part in the NRA, it is important that they receive adequate funding.

Improving skills for work and lifetime learning

We are not convinced that a separate grading concerned with calculation, estimation and statistics on GCSE mathematics certificates is necessary or desirable(61). Our preference is for the mathematics curriculum to be adjusted to ensure that numeracy plays a central part alongside other aspects of mathematics. Students need a balanced mathematical understanding, in which these aspects play a central role. Separate grading runs the risk of distorting the curriculum, and downgrading other important aspects. We note that the GNVQ core skill unit 'Application of Number' is concerned with these aspects of mathematical preparation, and consideration should be given to approving this unit for Key Stage 4 (62).

We support reviewing mandatory cores for A level subjects to identify the scope to build in relevant key skills (63). In such an exercise it is important that subject integrity should not be compromised.

We have some concerns about a separate, free-standing AS in key skills (64). Where possible key skills should be developed in the context of subjects. A free-standing AS should not imply that these skills are taught outside the context of the subjects being studied. For those students whose study programme does not afford opportunities to develop the key skills the AS would be a final guarantee that these skills can be developed.

We support the importance attached by the Review to the key skills (65). To ensure that they are recognised as such we would hope that funding regimes and guidance systems give due emphasis to their development.

As we note above, we support the development of key skills within the context of other subjects studied. We are concerned, therefore, that the percentage of marks allocated to the key skill development by coursework (66) is too low to allow for their proper development.

National targets, National Certificates and the National Advanced Diploma

We see no clear rationale for the proposed National Certificate (79-86) other than to focus attention on the National Education and Training Targets. It is difficult to see students, higher education or employers recognising or giving currency to this award. It adds little value to the existing qualifications which it will overarch. Our concern is that it may devalue the other proposed group award, the National Diploma. We therefore would wish to see this recommendation dropped.

We fully support the development of the National Diploma (87-94) which would recognise and encourage breadth and depth of studies. This recommendation draws on proposals outlined by the Society in its 1991 report *Beyond GCSE*, the principal difference being the Society proposed three domains of study while the 16-19 Review recommends four.

However, we see a considerable barrier to the widespread adoption of the proposed National Diploma, not least by those students who wish to follow a programme of study in which their two main subjects are within the same knowledge domain. For example, students who choose a science subject and mathematics as their main subjects would have to study to at least AS level in the three remaining domains, plus satisfy the requirements for Key Skills AS to achieve the National Diploma. In such cases students would have to follow the equivalent of four A levels or two full Advanced GNVQs. This breadth of study may be desirable, but it is an extremely demanding programme of study. It would be a considerable step above that achieved by the majority of students. Thus the incentive to aim for the National Diploma, rather than a traditional programme of A levels or Advanced GNVQs, will be minimal. As can be seen in the example above, we have specific concerns that science students may be disenfranchised from the National Diploma. Without widespread adoption of the National Diploma it will not be valued by students, higher education or employers. This lack of currency will threaten the thrust of the 16-19 Review to provide for both breadth and depth of study.

We would hope, as part of the implementation of the Review, that further thought can be given to the exact characteristics of the Advanced Diploma, perhaps based on consultation. The Society would prefer to see a more flexible set of criteria for the award of the Diploma, which did not require students to follow a prescribed pattern of breadth, but one in which there would still be a measure of choice within a broad based education. Examples of this may include the award of an Advanced Diploma for the successful study of four out of five available domains, as suggested by the Joint Associations, or three broad, flexible domains as suggested in *Beyond GCSE*. We believe that amending the proposals for the Advanced Diploma along these lines would significantly strengthen the impact of the Review as a whole.

The GNVQ, NVQ and other vocational qualifications

We support the use of Part One GNVQs for 16-19 year olds (95) building on the development work for 14-16 years olds. In the interest of a greater understanding of this phase of education we support the proposed change in title of Advanced GNVQ to Applied A level, and that the full GNVQ of 12 units be known as Double Award Applied A level (96, 97). Similarly, we support the proposal to rename GNVQ awards at Foundation and Intermediate level (99).

We would urge that care is exercised in developing the new 6 unit GNVQ (97), the Applied A level, so as not to threaten the coherence of subject material which is likely to be derived from existing 12 unit awards. It is important that curricular units, whether they be A level modules or GNVQ units are the same size. We support in principle the development of a three unit GNVQ (98), but recognise that this will not be without problems. The recognition that the introduction of GNVQ studies into many schools and colleges will have significant resource implications (101-108) is important, and receives our full support.

We support revision of the GNVQ tests (110-112), but note that it is essential not to undermine the philosophy underpinning the GNVQ assessment system.

The rigour of A levels

We recognise that the difference in the severity of grading schemes between different subjects is a matter for concern, and agree that we would not wish to see a diminution of standards (116-118). It is important that there is a 'level playing field' in terms of subject difficulty.

In principle we agree that there should be a concerted effort to reduce the number of syllabuses available (121-123), but it is important that this does not stifle innovation in syllabus design. We support the retention of linear and modular A levels (129) and strongly endorse the use of 15% of the marks available in a modular scheme for synoptic assessment. We support the introduction of limits to the number of resits available for any one module. We strongly support the recommendation (130) that regulatory bodies should examine the opportunities to develop further the specification for the mandatory core of A levels in terms of required learning outcomes.

Mathematics and the sciences

While we support the notion of stretching the most able students, we are not convinced that encouraging prospective A level mathematics students to take an additional GCSE paper in mathematics (131, 132) is the most appropriate course of action. The implementation of this proposal would be difficult in many schools, as would the selection of which students should follow this option. With regard to the mathematical preparation of students embarking on undergraduate courses with a high mathematical content, it is firmly our view that their needs (and the recently expressed concerns of higher education) would best be addressed by a clearer focus on a smaller body of fundamental mathematical tools rather than a broad acquaintance with a range of material. We are in favour of the regulatory bodies taking a more proactive role in ensuring appropriate material is available to bridge the gap between GCSE and A level (133). In this respect independent learning materials often prove to be particularly valuable.

We support further consideration of the content of A levels in mathematics and science, including where necessary increasing the size of the mandatory cores in these subjects (134, 140). We note, however, that the last exercise in approving the mandatory cores attracted much criticism particularly from the physics community. A review of this exercise must take full account of the views of those who have an interest in the development of these subjects. This could follow the pattern of the 'Fitness for Purpose' study commissioned by the 16-19 Review, ensuring that the views of higher education and employers are fully understood. A parallel review of GNVQ science (147) will also be of value.

The principal recommendations of the 16-19 Review should make for a more flexible system of A and AS levels. We firmly support such flexibility. This should allow some students to supplement their A level mathematics with further studies, perhaps to take double mathematics (135), or to support other subjects areas, e.g. mathematics for biological sciences.

We are in favour of the regulatory bodies continuing to collect evidence to establish whether the current range of GCSE courses in science provides sufficient preparation for further study at A level (138). This exercise should take due account of the fact that the majority of students starting A level science come from double-award GCSE science courses. We are pleased to see that the review recommends that schools should use 20% of curriculum time for double-award science GCSEs. We reaffirm our support for the great majority of students using 20% of their curriculum time at 14-16 on the study of science.

We support the recommendation that the regulatory bodies and the Teacher Training Agency commission further research into the factors which affect the attitudes of pupils, teachers and parents to mathematics and the sciences (143, 144). This research will be of great value in syllabus design and in increasing the take-up of these subjects.

We strongly support the recommendations for a reformulated AS level (148-157). This will provide more flexibility in the 16-19 system. We particularly welcome the recommendation that regulatory bodies should examine the case for a broader range of subjects or different uses of subjects through the AS level. These would include for example AS levels which are designed to serve the mathematical needs of other subjects, particularly sciences, AS levels for subjects not available pre-16, or broader subjects such as an AS in science. The new AS level would then allow students to get a clear view of the study of individual subjects before committing themselves to a full A level, or would provide opportunities for coherent study of a subject, but not to the full depth of an A level.

Recognising a wider range of achievement

We broadly support the recommendations for lower ability students (158-168).

We welcome the Review's emphasis on stretching the most able students, and support the range of recommendations on achieving this (169-177). We hope that the resource implications for schools and colleges will be fully recognised in further developing these schemes. It is important that students, and their school or college, have an incentive to pursue an extension option. In this respect we hope that the new UCAS points scheme will provide greater flexibility to recognise this achievement, including perhaps opportunities outside their curriculum such as the CREST scheme (180).

In the light of other recommendations in the report we feel that the role of General Studies is reduced past the point of viability. We therefore do not support the further development or use of this A level (178).

Removing barriers to achievement

We strongly support the recommendation that excellent, independent careers education should be provided to all young people (184).

Action

We support those recommendations which address the development and implementation of the main reforms recommended in the 16-19 Review (192-198). In particular we would stress that development of key skills (194) should ensure that they are meeting the needs of young people. Without specific attention being paid to the implications of the Review for initial teacher training and in-service (196, 197) the chance of success for many of the recommendations will be significantly diminished.