Consultation response for the Review of post-16 qualifications at level 3: Second stage

Introduction

As part of the Department for Education's review of post-16 qualifications at level 3, we responded to a consultation seeking views on the proposals for the groups of qualifications that would continue to be funded alongside A-levels and T-levels.

Those questions in the consultation to which we did not have relevant points to raise in response are greyed out, but included for completeness.

Response

6. Do you agree that the two groups of qualifications outlined in paragraph 45 are needed for 16 to 19 year olds choosing technical provision?

Yes/No

Please explain

The two groups are:

** Qualifications providing occupational competence against employer-led standards which are not covered by T levels.*

** Additional specialist qualifications, eg that dive deeper into particular occupational areas.*

7. Do you agree with the funding criteria described in paragraph 47 for the other technical qualifications we propose to fund for 16 to 19 year olds (qualifications providing occupational competence against employer-led standards which are not covered by T Levels and additional specialist qualifications)?

Yes/No

Please explain

8. Should the Institute create additional T Levels for pathways or occupations featured on the occupational maps? If so, please indicate the pathway(s)/occupation(s) and explain why.

Yes/No

Please explain

9. Do you agree with our approach to removing funding approval for qualifications that overlap with T Levels, described in paragraphs 52 to 66? Are there any other factors we should consider when deciding whether a qualification overlaps with T Levels?

Do you agree with our approach to removing funding approval?

Yes/No

Are there any other factors we should consider?

Yes/No

Please explain

10. Do you agree that the types of small qualifications described in paragraphs 71 to 73, that should typically be taken alongside A levels, should be funded?

Yes/No

Please explain

The Royal Society of Chemistry supports funding of small qualifications alongside A-levels as described, but opposes the suggestion in paragraph 73 that qualifications in science that can offer progression to HE would not be funded.

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There is a need to maintain a 'middle' route in the sciences, currently fulfilled by applied science qualifications such as BTECs, Cambridge Technicals etc. Removing funding from these qualifications risks closing off the option to progress in sciences for thousands of students each year, jeopardising attempts to increase participation in the sciences to ensure ongoing development of skills for initiatives such as the Industrial Strategy, increase of spend on R&D, and achievement of Net Zero targets. Removing this route to sciences would therefore be fundamentally counter-productive to the needs of society, as well as the Government's explicit aims. Additionally, it would represent a setback in inclusion in the sciences, as applied science qualifications are proportionally more used by students from less advantaged backgrounds.

Around 25,000 students currently achieve applied science qualifications at level 3 every year. Many of these students progress to higher education; about 7% of students domiciled in England, Wales or Northern Ireland who are accepted onto a UK chemistry degree hold a BTEC.[1] Data shared with us by Pearson show that, additionally, many hundreds of students progress from BTEC to degree study in related areas such as Biochemistry, Pharmacology and Environmental science – which support vital areas of research and innovation such as life science.

The consultation document suggests that these students would be better served taking A-levels. However, the reality is that, for many of these students, the choice is not 'applied general or A-level', it is 'applied general or nothing (at least not in the sciences)'. This is a significant concern for us, as many in our community are already concerned that chemistry student numbers have receded from a high point in 2015.[2] While applied science qualifications represent a route used only by a minority of prospective students, the need for knowledgeable and skilled scientists to support future innovations demand that we explore ways to expand access, rather than introducing further barriers.

Chemistry and other science A-levels are widely perceived as being more difficult than many other A-level subjects. There is significant statistical evidence to suggest that grading standards across subjects are not aligned, meaning that chemistry is one of the hardest A-level subjects to achieve high grades in.[3] This leads to many sixth forms setting higher entry requirements to study chemistry and other sciences at A-level than other subjects,[4] commonly a grade 6 at GCSE in Chemistry or Combined Science.

Applied generals in science therefore offer an alternative progression route for students with lower, but still good, GCSEs, who are motivated to study science. Attainment being correlated to socio-economic status, these students are more likely to be from disadvantaged backgrounds. If applied science qualifications disappear, most of these students will not have a progression option. Participation and inclusion in sciences will fall. This would be a tragedy. As it is, chemistry is less accessible for students from certain backgrounds; undergraduate students in chemistry are less likely to have family members with a background in routine and semi-routine occupations, compared to all subjects. Chemistry students' family backgrounds are much more likely to be in higher managerial and professional occupations.[5] The Department's proposals will increase barriers to participation, at a time when we should be working to remove them.

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[3] *Inter-subject comparability technical report science*, Ofqual, November 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757839/Inter-subject_comparability__-_technical_report_science_.pdf
[4] *Is chemistry accessible for all?*, Royal Society of Chemistry, November 2020, https://www.rsc.org/globalassets/22-new-perspectives/talent/is-chemistry-accessible-for-all/rsc-is-chemistry-accessible-for-all.pdf
[5] ibid.

Higher education is of course not the only progression option; some students currently taking applied science qualifications aspire to progress directly to the workplace, and aspects of the qualifications are designed accordingly. It is true that some of these students may wish to study a T-level once these become available; we hope that the Science T-level becomes a well-used and successful route to vital occupations such as laboratory technician, and we have provided support and input to the development of the route in several ways. However, this route is not yet rolled out, and so its success cannot be guaranteed. Moreover, the requirement to include an industry placement, while valuable, means places will inevitably be limited, and there are likely to be gaps in regional coverage. We do not expect the Science T-level route, certainly in its first few years, to accommodate anywhere near the order of 25,000 students who currently study applied generals in science. It must further be recognised that T-levels may offer less flexibility for the student who knows that they would like to progress in science, but does not yet want to commit to occupation-related study at the age of 16. Applied science qualifications keep options open, whereas it remains to be seen whether the T-level would function as an alternative route to Higher Education in the way that applied science qualifications currently do; universities are yet to state whether they will accept T-level achievers onto degrees in chemistry and other sciences.

In summary therefore, the Royal Society of Chemistry is extremely concerned that the proposal to remove funding from applied general qualifications will reduce overall participation, and increase inequality in participation, in sciences at level 3 and above. These qualifications are well-used and recognised, and play a valuable role allowing a wide range of students to keep their options open in regard to progression in the sciences. They should remain funded, certainly pending establishment of the Science T-level in the landscape and evaluating its success in supporting students' progression to a range of outcomes in sciences.

11. Do you agree with our proposal that performing arts graded qualifications, core maths, advanced extension awards and Extended Project qualifications should continue to be funded?

Yes/No for each of the 4 quals listed.

Please explain

12. Are there any other types of qualifications that we should continue to fund to be taken alongside A levels?

Yes/No

Please explain

The Royal Society of Chemistry wishes to see funding of applied general qualifications in sciences maintained alongside A-levels.

There is a need to maintain a 'middle' route in the sciences, currently fulfilled by applied science qualifications such as BTECs, Cambridge Technicals etc. Removing funding from these qualifications risks closing off the option to progress in sciences for thousands of students each year, jeopardising attempts to increase participation in the sciences to ensure ongoing development of skills for initiatives such as the Industrial Strategy, increase of spend on R&D, and achievement of Net Zero targets. Removing this route to sciences would therefore be fundamentally counter-productive to the needs of society, as well as the Government's explicit aims. Additionally, it would represent a setback in inclusion in the sciences, as applied science qualifications are proportionally more used by students from less advantaged backgrounds.

Around 25,000 students currently achieve applied science qualifications at level 3 every year. Many of these students progress to higher education; about 7% of students domiciled in England, Wales or Northern Ireland who are accepted onto a UK chemistry degree hold a BTEC.[6] Data shared with us by Pearson show that, additionally, many hundreds of students progress from BTEC to degree study in related areas such as Biochemistry, Pharmacology and Environmental science – which support vital areas of research and innovation such as life science – as well as many other areas of science.

The consultation document suggests that these students would be better served taking A-levels. However, the reality is that, for many of these students, the choice is not 'applied general or A-level', it is 'applied general or nothing (at least not in the sciences)'. This is a significant concern for us, as many in our community are already concerned that chemistry student numbers have receded from a high point in 2015.[7] While applied science qualifications represent a route used only by a minority of prospective students, the need for knowledgeable and skilled scientists to support future innovations demand that we explore ways to expand access, rather than introducing further barriers.

Chemistry and other science A-levels are widely perceived as being more difficult than many other A-level subjects. There is significant statistical evidence to suggest that grading standards across subjects are not aligned, meaning that chemistry is one of the hardest A-level subjects to achieve high grades in.[8] This leads to many sixth forms setting higher entry requirements to study chemistry and other sciences at A-level than other subjects,[9] commonly a grade 6 at GCSE in Chemistry or Combined Science.

Applied generals in science therefore offer an alternative progression route for students with lower, but still good, GCSEs, who are motivated to study science. Attainment being correlated to socio-economic status, these students are more likely to be from disadvantaged backgrounds. If applied science qualifications disappear, most of these students will not have a progression option. Participation and inclusion in sciences will fall. This would be a tragedy. As it is, chemistry is less accessible for students from certain backgrounds; undergraduate students in chemistry are less likely to have family members with a background in routine and semi-routine occupations, compared to all subjects. Chemistry students' family backgrounds are much more likely to be in higher managerial and professional occupations.[10] The Department's proposals will increase barriers to participation, at a time when we should be working to remove them.

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[9] *Is chemistry accessible for all?*, Royal Society of Chemistry, November 2020, https://www.rsc.org/globalassets/22-new-perspectives/talent/is-chemistry-accessible-for-all/rsc-is-chemistry-accessible-for-all.pdf
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13. Do you agree that the group of qualifications described in paragraphs 79 to 80 should be funded to be taken as alternative programmes of study to A levels?

Yes/No

Please explain

The Royal Society of Chemistry makes no comment specifically on the proposals outlined in paragraphs 79 to 80. However, we oppose the proposal in paragraph 81 that large qualifications in science that overlap in part with either T-levels or A-levels would not be funded.

There is a need to maintain a 'middle' route in the sciences, currently fulfilled by applied science qualifications such as BTECs, Cambridge Technicals etc. Removing funding from these qualifications risks closing off the option to progress in sciences for thousands of students each year, jeopardising attempts to increase participation in the sciences to ensure ongoing development of skills for initiatives such as the Industrial Strategy, increase of spend on R&D, and achievement of Net Zero targets. Removing this route to sciences would therefore be fundamentally counter-productive to the needs of society, as well as the Government's explicit aims. Additionally, it would represent a setback in inclusion in the sciences, as applied science qualifications are proportionally more used by students from less advantaged backgrounds.

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[12] *Fears for Britain's standing in world of science as students shun chemistry degrees*, The Guardian, 31 August 2019, https://www.theguardian.com/education/2019/aug/31/students-shun-chemistry-degrees-university-applications-fall

[13] *Inter-subject comparability technical report science*, Ofqual, November 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757839/Inter-subject_comparability__-_technical_report_science_.pdf

[14] *Is chemistry accessible for all?*, Royal Society of Chemistry, November 2020, https://www.rsc.org/globalassets/22-new-perspectives/talent/is-chemistry-accessible-for-all/rsc-is-chemistry-accessible-for-all.pdf

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14. Do you agree with our proposal the IB Diploma should continue to be funded?

Yes/No

15. Do our proposals for academic qualifications for 16 to 19 year olds (set out in paragraphs 67-82) provide opportunities to progress to a broad range of high quality higher education?

Yes/No

Please explain

The Royal Society of Chemistry is concerned that the proposals will reduce opportunities to progress to higher education in the sciences for some students. Removing the applied general route in science means that students who do not meet science A-level entry requirements, or who consciously decide against the mode of study that A-levels represent to them, will become likely to choose other subject areas. These students are more likely to be from disadvantaged backgrounds or other groups whose attainment at GCSE is not necessarily a reflection of their full potential. Applied science qualifications help to keep options open, promote participation in sciences, and challenge the perception that achievement in science is only for people who are highly intelligent. Removing applied science qualifications from the landscape will create more barriers to participation in sciences, at a time when we should be working to remove them.

16. What additional support might students need to achieve the new high quality offer at level 3?

Please explain

A T-level transition programme is currently being developed for students wishing to pursue that route, but who are not ready to start a T-level at age 16. A similar option could be considered for those who are not yet ready to start A-levels.

As detailed in responses to questions 10, 12 and 13, entry requirements for A-levels in chemistry and other sciences can be particularly stringent. If the applied science route were to become unavailable, large numbers of students with motivation and potential to succeed in sciences are likely to be excluded. If the Department for Education sees A-levels as the preferred option for progression to higher education, and wishes to see more students participate in science learning post-16, it must explore options to enable more students to access A-levels over the course of time. Alternatively, or additionally, A-levels themselves should be made more accessible to a larger number of learners, for example by re-opening the review of grading standards in science A-levels and addressing the greater severity applied compared to many other subjects.

17. What additional support might SEND students need to achieve the new high quality offer at level 3?

Please explain

While it must be recognised that the experiences and capabilities of SEND students vary greatly, on average there are well documented attainment gaps at key stage 4 between students with and without SEND. Therefore, SEND students may be more likely than their peers to need support in directly progressing from GCSEs to A-level study in the sciences due to the particularly stringent entry requirements in these subjects. Programmes and system flexibility to support this should be considered alongside support for transition to T-levels, as also set out as a more general principle in our response to question 16.

18. Are there level 3 qualifications that serve the needs of SEND students that cannot be met by the proposed qualification groups in the new 16 to 19 landscape?

Yes/No

It is not straightforward to find data exclusive to science qualifications, but we believe that applied science qualifications play a role in serving the needs of SEND students in the current system, and this adds to the arguments for maintaining these qualifications set out in questions 10, 12 and 13. There are well documented attainment gaps at key stage 4 between students with and without SEND (on average, recognising wide variance in individual experience). As a certain level of attainment is required to access A-levels, and this requirement is often higher for chemistry and other science A-levels, students with SEND will be more likely to find themselves excluded from the academic route in sciences if there is not the applied general alternative. As detailed elsewhere, we do not expect the Science T-level to be available as widely as applied generals currently are.

Please explain providing specific qualification examples where possible

19. Do you agree with our proposal to fund the same academic options for adults as 16 to 19 year olds?

Yes/No

Please explain

The Royal Society of Chemistry is very supportive of adults being able to access routes to the sciences, to allow them to upskill or retrain, and providing wider access to participation in the sciences. Adults generally need a greater level of flexibility in education provision than young people, and this brings particular considerations relating to the practical requirements in science A-levels. Currently, private exams centres often do not offer science A-levels due to the practical assessment requirements. Some Further Education colleges that have a developed adult education offer may currently not offer A-levels at all. Mechanisms to overcome these barriers should be considered.

Applied science qualifications do currently appear to offer a route with the necessary flexibility to support adult learners. Around half of the 2019 chemistry undergraduate intake who held a BTEC were categorised as 'Not Applicable for A-level',[16i] suggesting that these students were over the age of 18 at application. This is a further suggestion that applied general qualifications offer an entry point to science study to students who may otherwise not have had the opportunity, and adds to our position that those qualifications should be supported at least as long as we can be sure that their removal would not close doors to prospective students.

[16] Data obtained from UCAS (EXACT purchase 003697).

20. Do you agree with our proposal to fund the Access to HE Diploma for adults (as well as for 16 to 19 year olds in exceptional circumstances)?

Yes/No

Please explain

21. Do you agree that the principles described in paragraph 104 are the right ones to ensure qualifications meet the needs of adults?

Yes/No

Please explain

The Royal Society of Chemistry agrees with the thrust of these principles, but we have a qualification regarding the principle of summative assessment at the end of the course. Assessment of any part of the course should be done in a format that is valid and gives sufficient reassurance that the sought-for standard is achieved, and summative assessment is not necessarily the right format for all that is valuable in a science qualification.

Summative assessment is valuable in sciences to allow students to apply understanding of a range of conceptual areas and set of techniques to a realistic scenario. However, there are also relevant skills that may be better assessed during the delivery of the course, as the limits to what is possible in a summative assessment can constrain the validity.

For example, for technical roles in the sciences it is relevant to ensure that students are competent in a range of laboratory techniques. This can be impractical to assess through a summative assessment, and a range of can-do tasks throughout the course may suffice when combined with a more applied assessment task at the end.

Additionally, the ability to research and plan procedures and report on findings may be better developed and assessed through investigative projects done in the course of study, than through an assignment assessed at the end.

Finally, we regularly hear from employers that they are looking for people in technical roles who demonstrate a greater level of professional skills such as communication, collaboration and team working, and time management. Again, these skills may not be best assessed through a summative assessment, which are frequently focused on the individual and conducted in a relatively short space of time that does not allow for full application of these skills.

22. Do you agree with our proposed approach to making T Levels available to adults?

Yes/No

Please explain

23. Do you agree with our proposal that T Level Occupational Specialisms should be offered as separate standalone qualifications for adults?

Yes/No

Please explain

This decision should depend on the individual subject area and how the T-level is constructed, rather than suggesting this should be a blanket possibility applied to all T-levels. In the Science T-level it is unlikely to be appropriate, as the Core contains a large amount of theoretical knowledge and workplace context that underpins the further knowledge and skills delivered in the Occupational Specialisms. The specialisms cannot be easily separated from the Core in this way. Recognition of prior attainment should be sufficient to ensure students do not need to cover content unnecessarily.

24. Do you agree that the groups of qualifications for adults outlined in this chapter should continue to be funded?

Yes/No

Please explain

25. What occupations fall outside the scope of the occupational maps but are in demand by employers (as described in paragraph 116)?

Please explain

26. Do you agree with our proposed approach to reforming technical qualifications?

Yes/No

Please explain

27. Is there anything else we should consider when implementing our proposed approach?

Yes/No

Please explain

28. Do you agree with the proposed approach to qualifications in apprenticeship standards?

Yes/No

Please explain

The Royal Society of Chemistry does not agree with the process being followed in the ongoing review of mandatory qualifications in apprenticeships. Specifically, we are opposed to the recent removal of a knowledge qualification from the level 3 laboratory technician standard. All occupations in sciences are well supported by a broad understanding of scientific concepts, which employees can draw on in solving new problems and innovating, as well as understanding the wider context in which they are working. An understanding of the impact of an apprentice's work for their wider team and organisation fosters a greater sense of job satisfaction, which supports retention of apprentices. Including a knowledge qualification also serves the interests of the apprentice in terms of enabling future development and career progression, which a narrow focus on the concepts required in their current occupational context may not. Therefore the criteria applied do not sufficiently recognise the central importance of subject knowledge in scientific occupations, or the needs of apprentices in addition to those of employees.

The Royal Society of Chemistry has recently begun awarding accredited status to vocational routes into the chemical sciences, including level 3 laboratory technician apprenticeship programmes. Our accreditation criteria include a requirement for a knowledge qualification; providers and employers we work with are very supportive of this, recognising the additional value that a qualification offers to apprentices. In a recent survey among 34 employers in our field, 31 stated that they wanted a knowledge qualification in an apprenticeship.

We do agree that systems and funding should continue to support qualifications where there is a need for them in the context of apprenticeships, and argue that this should continue to be the case for laboratory apprenticeships. An additional reason for maintaining support for applied science qualifications – alongside our reasons relating to higher education progression set out in questions elsewhere – is that they are well suited to being studied in the context of an apprenticeship.

29. Do you agree with our proposed approach to reforming academic qualifications?

Yes/No

Please explain

30. Is there anything else we should consider when implementing our proposed approach?

Yes/No

Please explain

The Royal Society of Chemistry asks that a review is conducted of the progression options that will be possible and supported from A-levels and T-levels in Chemistry / Science to ensure equivalence, and that this is monitored over time.

We are concerned that progression options from the Science T-level could be considerably restricted compared to the options from A-levels.

Students achieving Chemistry A-level can, and do, currently progress to undergraduate degrees, level 4/5 qualifications, and directly into the workplace. A-level students can take a level 3 laboratory apprenticeship, as well as start higher level apprenticeships if considered appropriate. There is nothing to suggest that this wide range of options will not remain available to those students.

However, it is probable that options for T-level students will be more limited. We hope that workplace transition will prove smooth. However, we understand that Science T-level students would not be able to progress to a level 3 laboratory technician apprenticeship due to the fact that the T-level is developed to the same standard. This is despite the fact that an apprenticeship at that level could provide useful further development in specific competencies that cannot easily be covered in the classroom situation. It is as yet unconfirmed whether a T-level achiever would be able to progress to degree-level study in chemistry, though study at levels 4/5 would presumably be possible. However, availability of level 4/5 qualifications related to chemistry is currently sparse, and there is only one relevant apprenticeship standard at level 5 (technician scientist), so in practice further development opportunities are not widespread.

We appreciate that the T-level is designed to be occupationally focused, and therefore not developed to match other progression options. However, a perceived lack of career development path from the T-level could harm aims to achieve parity of esteem between academic and technical routes.

31. What support is needed to smooth the implementation of the proposed reforms?

Please explain

Ideally, as detailed in responses throughout, funding for applied general qualifications in sciences should be maintained, in the interests of maximising the opportunities for students to progress into the sciences, avoiding greater inequality in participation, and providing a useful knowledge qualification to support the level 3 laboratory technician apprenticeship. This should be maintained at least as long as required for the Science T-level to become embedded, and to evaluate

1. How many students take this route, and how uptake of post-16 science has been impacted overall.

2. How well the Science T-level functions as a route to science occupations, both directly into the workplace and through providing an alternative route to higher education.

3. Any gaps in regional availability of the Science T-level.

4. How A-levels, and by extension higher education study in sciences, can be made more accessible to currently underrepresented groups.

If the reforms are followed as intended, the following areas of support are required to avoid a huge decrease in participation in sciences post-16 and beyond:

- Support for more students to access A-levels, enabling them to subsequently progress to higher education. This could take the form of reviewing the accessibility of A-levels themselves (for example by re-opening the question of grading standards), and/or by offering support for students who are not ready to access science A-levels at age 16. This could take the form, for example, of an A-level transition programme, or three-year funded A-level programmes.

- Active support, including funding, to enable employers in the science sector to offer industry placements, so that the Science T-level route can accommodate an appreciable number of students.

- Monitoring whether higher education institutions accept the Science T-level for entry onto chemistry and other science degrees; if not, making provision for a suitable transition offer. We note at this point that the original post-16 plan indicates that bridging provision would be available where appropriate from level 3 technical options to undergraduate degrees. However, this is not referred to in recent government documentation, such as the latest T-level action plan.[17] The option must be kept in mind in the event that direct progression options prove limited.

[17] *T Level Action Plan 2020*, Department for Education, January 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951488/T_Level_Action_Plan_2020_.pdf