RSE
The Royal Society of Edinburgh
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ADVICE PAPER
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EDUCATION REFORM CONSULTATION
LEARNED SOCIETIES GROUP RESPONSE

Section 1 *Vision*

- The LSG supports the Curriculum for Excellence (CfE) in principle, though its implementation has often fallen short of expectations.

- It is necessary to develop the curriculum with a clear initial view of the outcomes and assessments to which it leads in order to ensure coherence across the system.

- Our vision for CfE is one where the curriculum is much more clearly defined in terms of what learners need to know, do, and understand, as highlighted in the Organisation for Economic Co-operation and Development (OECD) review of CfE.

Section 2 *Curriculum & Assessment*
Progression

- The pace and intensity at which the curriculum is taught is not uniform across the system, with steep increases in expectations interspersed with periods of comparative inertia. We were disappointed that the recent OECD review did not adequately resolve this issue of uneven progression.

- Primary-level STEM education continues to be hamstrung by several issues that were overlooked by the OECD review, such as the enduring problem of a lack of knowledge and confidence in primary STEM teaching.

- We would welcome a complete review of the CfE Experiences and Outcomes and Benchmarks across the STEM subjects with the aim to much more clearly define what learners are expected to know, do, and understand, as is described by the OECD in its review of CfE.

Autonomy and empowerment under Curriculum for Excellence

- Historically, the curriculum has largely followed the parameters set by qualifications and assessments. This has in practice undermined the autonomy and creativity that CfE as envisioned was supposed to support, particularly in the senior years. There is more progress to be made in empowering teachers to become effective curriculum-makers.

- The delivery of STEM subjects has at times suffered due to the overgeneralisation of certain pedagogical approaches and unclear and sometimes contradictory guidance around pedagogical approaches and local curriculum-making.

Developing a new curriculum and assessment agency

- An independent curriculum and assessment agency operating on a regular schedule of curriculum review could help to ensure that CfE as a curricular model is properly scrutinised and decoupled from political timelines.

- Developing a new curriculum and assessment agency may, in practice, essentially replicate the functioning of the bodies it is intended to replace (particularly SQA) and divert attention and resources away from more pressing and fundamental issues, such as the need to consider the design and content of the curriculum itself. Structural change is preceding the necessary cultural change.

Breadth of qualifications

- The LSG has long been concerned with issues of teacher recruitment and retention, both of which would help to deliver a broader range of SQA qualifications by increasing the number of teachers available to deliver them.

- Perhaps the most visible and high-profile problem associated with the implementation of CfE has been a decline in subject choice. One way in which reduced subject choice might be circumvented could be to rationalise the distribution of the curriculum and qualifications across successive years.

- In response to the issue of curriculum narrowing at S4, the OECD report talks about the scope for subjects to become broader rather than increasing their total number. While this could have some positives, by their nature the STEM subjects benefit from a more in-depth and sustained teaching of core concepts before bringing in interdisciplinary approaches.

Technology

- The COVID-19 pandemic taught us that digital alternatives can in some instances be good complements to practical laboratory work. However, practical laboratory work continues to provide benefits that web-based lab experiences cannot.

Section 3 *Roles & Responsibilities*

Responsibility for the strategic direction, review, and updates for Curriculum for Excellence

- The notion of fragmented, unclear ownership of the curriculum is prevalent throughout the OECD report. Many bodies and actors exist whose role in curriculum design and delivery has not been properly delineated, leading to widespread confusion around respective responsibilities and noticeable gaps in accountability. These are systemic and structural problems that will need to be remedied before sustained ground-level improvements can be enacted.

Role of national agencies and other providers

- There is a lack of support across the "middle" of the system, which is instrumental in facilitating the implementation of various aims on the ground (e.g. in providing access to subject-specific career-long professional learning).

Support for leadership and professional learning

- Both within the OECD report and Scottish Government's response to it, there is no mention of the subject-specific support that would be necessary to improve the capacity of teachers in curriculum making within their subject areas and who should be tasked with delivering it. It is recognised that teacher expertise has the greatest effect on student achievement in the STEM subjects.

- Some teachers are more confident than others in their assessment capabilities and it will be important to ensure that all teachers are supported in developing this skill, particularly if assessment moves further into the classroom and a wider range of assessment options is introduced.

Stakeholder involvement in decision-making

- Beyond the obvious need to engage with children, young people, parents, and carers, it will also be important to engage with employers, tertiary education institutions, and other relevant stakeholders in any decision making.

Scrutiny and evaluation

- Some would argue that the system is currently being driven largely by an accountability agenda, both through the inspectorate but also in the form of high-stakes examinations. There could be scope for Scotland to set up a more supportive quality-assurance system.

Comments and Questions
Section 1 *Vision*

1.1. The vision for Curriculum for Excellence reflects what matters for the education of children and young people in Scotland

[Strongly Agree/Agree/Neither Agree/Disagree/ Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

1.2. What do you think should be retained/and or changed?

1 The LSG supports the Curriculum for Excellence (CfE) in principle, though its implementation has often fallen short of expectations. However, CfE may be one of many curricular models with the capacity to deliver what we want from a 21st century Scottish education system. As such, there could be value in unpacking long-held assumptions about CfE's aims and aspirations and exploring the potential benefits of alternative curricular approaches to ensure our views on CfE are well-informed.

2 It is necessary to develop the curriculum with a clear initial view of the outcomes and assessments to which it leads in order to ensure coherence across the system. A continued focus on, and ongoing changes to, the assessment of national qualifications diverts secondary teachers' attention, time, and resources away from a focus on teaching and learning towards reverse engineering the curriculum to align with the assessments and a resulting emphasis on 'teaching to the exam' rather than wider educational aims. It is very unfortunate that assessment developments have driven CfE reforms when the original intentions of CfE were focused on transforming learning and teaching through strengthening teacher agency in curriculum development, rather than on reforming qualifications.

3 In proposing any major reforms, it is important that wider society is involved in the engagement process in order to secure buy-in and support. This is particularly important for any radical change to qualifications.

4 It is worth pointing out that the 'refreshed narrative' which followed the previous OECD report did not lead to much change. As such, we would like to see that a genuine review of the curriculum is undertaken which leads to a substantive culture change.

5 As will be elaborated on in Section 2, our vision for CfE is one where the curriculum is much more clearly defined in terms of what learners need to know, do, and understand, as highlighted in the OECD review. As the OECD review of CfE also explored, the importance of domain-specific knowledge has been thus far under-appreciated and under-emphasised in CfE and this requires rectification.[1, 2, 3, 4, 5] It is important that knowledge is developed through the Broad General Education (BGE) in a coherent and systematic manner. Although this applies to all subject areas, this is particularly important in the STEM subjects where powerful enabling concepts must be developed, understood, and consolidated to allow effective and efficient future learning. A knowledge-rich and skills-oriented curriculum [6] throughout the BGE will provide our children and young people with the solid knowledge base on which to develop the much sought-after higher-order thinking skills such as creativity, criticality, and problem-solving and better prepare them for the study of National Qualifications, Skills for Work courses, and other qualifications in the Senior Phase.

6 A clear definition of what learners need to know, do, and understand will have added benefits. This includes allowing teacher professional learning to be better targeted and focused on activities supporting teaching and learning and improving pupil outcomes and allowing for a smoother transition between schools if learners have to move between different locations during their schooling.

1 Deng, Z. (2020). *Knowledge, Content, Curriculum and Didaktik: Beyond Social Realism*. Routledge.

2 Young, M. (2008). *Bringing Knowledge Back In: From social constructivism to social realism in the sociology of education*. Routledge.

3 Young, M. (2013). Overcoming the crisis in curriculum theory: a knowledge-based approach. *Journal of Curriculum Studies, 45* (2), 101-118. https://doi.org/10.1080/00220272.2013.764505

4 Young, M. (2020). From Powerful Knowledge to the Powers of Knowledge. In C. Sealy (Ed.). *The Curriculum: An evidence-informed guide for teachers* (pp. 19-29). John Catt.

5 Young, M., Lambert, D., Roberts, C., & Roberts, M. (2014). *Knowledge and the future school: Curriculum and social justice*. Bloomsbury Academic.

6 Robertson, B. (2021). *The Teaching Delusion 2: Teaching Strikes Back*. John Catt Educational Ltd.

Comments and Questions
Section 2 *Curriculum & Assessment*

2.1. **Curriculum for Excellence provides a coherent progression in the journey of learners (3 – 18 and beyond) that gives them the best possible educational experience and enables them to realise their ambitions.**

[Strongly Agree/Agree/Neither Agree/Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

2.2. **Please share what you believe currently contributes to a coherent progression.**

The Learned Societies' Group has not provided an answer to this question.

2.3. **Please share ideas you may have to improve learner progression across stages and sectors.**

7   Curriculum delivery should resemble a continuum, with congruity between successive stages and a sensible and sustained rate of progression throughout. As it stands, the pace and intensity at which the curriculum is taught is not uniform across the system, with steep increases in expectations interspersed with periods of comparative inertia. For example, even before the introduction of CfE, the S1/S2 years were cited as a weak point in the system during which students made relatively little progress before moving to a more demanding Senior Phase and the pursuit of National Qualifications. This stop-start approach to curriculum delivery can make it more difficult for students to consolidate their understanding and make connections between different ideas, especially across STEM subjects that require students to gradually build upon core concepts.

8   The curriculum in its current form does not allow for a coherent and smooth progression in terms of developing knowledge; content can be delivered in a disjointed way wherein different topics are not logically connected nor are they revisited and built upon at a later stage. We were

disappointed that the recent OECD review did not adequately resolve this issue of uneven progression. There is concern that delaying meaningful STEM knowledge acquisition until the Senior Phase will leave learners unprepared to study these subjects at a senior level and could dissuade them from these subjects; STEM subjects are already often perceived as being difficult,[7] which could in part be due to this lack of preparedness.

9   Primary-level STEM education continues to be hamstrung by several issues that were overlooked by the OECD review, such as the enduring problem of a lack of knowledge and confidence in primary STEM teaching. Solving issues at the secondary level will be severely hampered if the problems that exist within BGE are not adequately resolved, once again highlighting the importance of transitions and progression between the different phases of the school system.

10 We would welcome a complete review of the CfE Experiences and Outcomes and Benchmarks across the STEM subjects with the aim to much more clearly define what learners are expected to know, do, and understand, as is described by the OECD in its review of CfE. This requires a focus on developing a curriculum with knowledge and concepts built up in a coherent and progressive manner.

3.1. **In practice, learning communities are empowered and use the autonomy provided by Curriculum for Excellence to design a curriculum that meets the needs of their learners.**

[Strongly Agree/Agree/Neither Agree/Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

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7   Coe, R., Searle, J., Barmby, P., & Jones. K. (2008). *Relative Difficulty of Examinations in Different Subjects*. CEM Centre, Durham University. https://www.researchgate.net/publication/232607636_Relative_Difficulty_of_Examinations_in_Different_Subjects

3.2. Please share ideas you may have on what is needed to enhance this in future.

11 In all sectors, good classroom practice and curriculum planning needs to be shared both locally and nationally to prevent the wheel from being reinvented. With its extensive networks of practising teachers across the STEM subjects, the LSG could be well-placed to facilitate such mutual knowledge exchange and collaboration.

12 Historically, the curriculum has largely followed the parameters set by qualifications and assessments. This has in practice undermined the autonomy and creativity that CfE as envisioned was supposed to support, particularly in the senior years.

13 At the heart of CfE lies a tension between teacher agency and the need for sufficient system-wide commonality of curriculum provision. The introduction of CfE has run in parallel to a number of other policy developments in Scottish education. [8] Not all of these have been mutually supportive of the aims of CfE, resulting in mixed messages about the role and expectations of teachers. There is a need for an open and genuine debate within the Scottish education system – with substantial input from practising teachers – on their role as empowered professionals and as curriculum-makers. The challenge will be to reconcile an appropriate degree of local autonomy with the benefits that a more centralised approach to curriculum design can provide, such as helping to avoid duplication of effort and enabling easier transitions across different schools. Providing some uniformity in curriculum entitlement is also important from an equality perspective.

14 There is more progress to be made in empowering teachers to become effective curriculum-makers. While the OECD report called for greater stakeholder engagement in the process of curriculum-building, it fails to adequately recognise the barriers that currently prevent teachers from taking greater ownership of curriculum design (e.g. limited time away from the classroom, especially when compared to other European countries). Scottish Government has committed to reducing teacher contact time by 1.5 hours per week; while this is a good development, these sorts of improvements should not be enacted in isolation. There is no benefit to enabling teachers to become better curriculum-makers if there is still a de facto expectation that they must teach to the exam or little 'middle-level' [9] support to help them improve practices. This reemphasises the need for coherent reform across the system, where changes enhance and support one another rather than being at odds.

15 There is a need to consider how schools will vary in their capacity to support teachers in setting their own curricula.

16 The CfE model's scope for autonomous implementation of curriculum design and delivery can also have a differential impact on subjects. This highlights the importance of having access to subject-specific career-long professional learning (CLPL), including that which incorporates training in curriculum design, pedagogy, and leadership.

17 The delivery of STEM subjects has at times suffered due to the overgeneralisation of certain pedagogical approaches and unclear and sometimes contradictory guidance around pedagogical approaches and local curriculum-making. This has potentially contributed to an overuse of inefficient teaching practices such as too great an emphasis being placed on open-ended problem-solving with learners who have not yet developed an adequate knowledge base for these practices to be effective or resulted in multi-course teaching of different courses in the same classroom simultaneously.

4.1. The creation of a Curriculum and Assessment Agency will help to address the misalignment of curriculum and assessment.

The misalignment of curriculum and assessments is outlined in the OECD report Scotland's Curriculum for Excellence: Into the Future.

[Strongly Agree/Agree/Neither Agree/Disagree/ Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

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8 These have included the Donaldson review of teacher education, the McCormac review of salaries and conditions of service, the introduction of the GTCS Professional Standards and Professional Code, the National Improvement Framework, governance changes, and the introduction of the Regional Improvement Collaboratives.

9 By 'middle-level', we are referring to OECD's concept of 'middle' as described in its 2015 report, i.e. 'networks and collaboratives among schools, and in and across local authorities' (pg. 10). OECD. (2015). *Improving Schools in Scotland: An OECD Perspective*. https://www.oecd.org/education/school/improving-schools-in-scotland.htm

4.2. Please share your views of the potential advantages of establishing such an Agency.

18 An independent curriculum and assessment agency operating on a regular schedule of curriculum review could help to ensure that CfE as a curricular model is properly scrutinised and decoupled from political timelines. It could also contribute towards system coherence if its remit were to cover CfE in its entirety (i.e. primary, BGE, and the Senior Phase).

4.3. Please share your views of the potential disadvantages of establishing such an Agency.

19 Developing a new curriculum and assessment agency may, in practice, essentially replicate the functioning of the bodies it is intended to replace (particularly SQA) and divert attention and resources away from more pressing and fundamental issues, such as the need to consider the design and content of the curriculum itself. Structural change is preceding the necessary cultural change.

5.1. The full breadth of existing SQA qualifications play an important part of the curriculum offered by secondary schools.

Please visit the SQA qualifications hub to see the full breadth of existing SQA qualifications.

[Strongly Agree/Agree/Neither Agree/Disagree/ Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question. However, we would like to include a general comment on SQA qualifications.

20 SQA serves an important purpose in offering a broad range of qualifications for learners, including National Qualifications, Skills for Work courses, and National Progression Awards, to allow multiple progression routes into employment and further studies in the STEM subjects for all learners. It is crucial that any successor agency take a similarly expansive approach to valuing different forms of learning and offering multiple progression pathways for pupils to choose from.

5.2. Please identify the main factors, if any, that support a broader range of SQA qualifications being included in the curriculum in secondary schools.

21 The LSG has long been concerned with issues of teacher recruitment and retention, both of which would help to deliver a broader range of SQA qualifications by increasing the number of teachers available to deliver them. This is true across the STEM subjects and beyond.

22 While total teacher numbers are currently the highest they have been since 2008, there are fewer Computing (down by 22%), Maths (down by 13%), and Physics (down by 7%) teachers now than there were then.[10] This comes against a backdrop of the introduction of new routes into teaching including bursaries aimed at encouraging new entrants into STEM teaching.

23 Teacher workforce planning needs to be underpinned by accurate data. This includes having a clear picture of teacher need across individual subjects and in different parts of Scotland. It is also important that data on the number of Initial Teacher Education (ITE) entrants that complete their courses and enter the teaching profession – and not only the ITE intake figures – is collected and published.

24 It is also important that we generate a better understanding of motivations for entering into, staying in, and leaving the teaching profession and use this to enhance the visibility and attractiveness of teaching as a career choice.

5.3. Please share any ideas you may have on what is needed to enhance the role of a broader variety of qualifications in the curriculum in secondary schools.

25 Perhaps the most visible and high-profile problem associated with the implementation of CfE has been a decline in subject choice. Although CfE increased subject choice in theory by expanding the total number of available courses and qualifications, pupils often do not have access to this same scope of courses in practice due to institutional limitations and practical restrictions. This narrowing of subject choice has been most evident at the S4 stage. The primary contributing factor has been a shift from two-year courses completed over the S3/S4 years to predominantly one-year, 160-hour courses completed entirely in S4. This has reduced the amount of time available for students to study different subjects, with six qualification courses at S4 the most common approach.

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10   Scottish Government. (2021, April 22). *Teacher census supplementary statistics.* https://www.gov.scot/publications/teacher-census-supplementary-statistics/

26 This narrowing is not the result of any conscious policy decision; rather, it is a consequence of the confusing national guidance on the relationship between the BGE and the Senior Phase, particularly in relation to the extent to which the BGE can be used to prepare learners for qualifications. To progress with study in many STEM subjects and into a wide variety of STEM careers, it is necessary (or at least advantageous) to have studied several STEM subjects during these important middle years of secondary education. The narrowing of the curriculum at this stage restricts both the pipeline of talent into the STEM subjects and the ability of our young people to benefit from a breadth of study at this stage in their education.

27 One way in which reduced subject choice might be circumvented could be to rationalise the distribution of the curriculum and qualifications across successive years. For example, national guidance states that CfE 3rd and 4th levels should be studied until the end of S3. In reality, some schools are already introducing National 4 (N4) and National 5 (N5) content during S3 due to its similarity to BGE 4th level content, though this coursework is ultimately recognised under the banner of BGE. Therefore, there could be an opportunity to make more efficient use of S3 by enabling N4 and N5 material to be covered and awarded as such, effectively freeing up more time during the Senior Phase for students to pursue a wider range of courses. This same philosophy could be applied to the link between S2 and S3 (with a shift in content from S3 to S2) and in running N4 and N5 courses across both S3 and S4. Such an approach would also likely increase the pace of learning and prove more motivating to pupils.

28 In response to the issue of curriculum narrowing at S4, the OECD report talks about the scope for subjects to become broader rather than increasing their total number. While this could have some positives, by their nature the STEM subjects benefit from a more in-depth and sustained teaching of core concepts before bringing in interdisciplinary approaches. This reflects the 'pillars and lintels' approach advocated for by the Royal Society of Edinburgh's *Interdisciplinary Learning: Creative Thinking for a Complex World* publication.[11]

29 The transition from primary to secondary could also be eased by placing these different sectors in direct and productive conversation with one another, ensuring this is a two-way process that builds on good practice found within both sectors and allowing teachers to have a meaningful conversation.

6.1. Technologies are fully and appropriately utilised as a support for curriculum and assessments.

[Strongly Agree/Agree/Neither Agree/Disagree/ Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

30 As a group representing the interests of the STEM subjects, we are particularly interested in ensuring that the integrity and availability of practical laboratory work is preserved. Practical laboratory work is essential in order to bring concepts to life, strengthen both knowledge retention and comprehension (on the basis of the adage, "I hear and I forget, I see and I remember, I do and I understand"), and allow pupils to develop skills in observation, planning, and analysis. It also replicates the conditions many pupils will face in post-school destinations in any "hands-on" working environment. Maintaining practical laboratory work in the curriculum will also be a key driver for other effects, such as the need for school technicians and budgets to acquire, maintain, and replace laboratory equipment.

31 The COVID-19 pandemic taught us that digital alternatives can in some instances be good complements to practical laboratory work. However, practical laboratory work continues to provide benefits that web-based lab experiences cannot.

32 While we welcomed Scottish Government's recent commitment to outfit every school-aged child in Scotland with a digital device, this rollout must be coupled with appropriate investments in improving connectivity (including the quick rollout of direct fibre links and improved coverage in remote areas), proper training, and (where necessary) app/software purchasing and/or licensing to ensure pupils can get the most out of these devices.

11   Royal Society of Edinburgh. (2020, February). *Interdisciplinary learning in Scottish schools.* https://rse.org.uk/expert-advice/advice-paper/interdisciplinary-learning-in-schools/

7.1. **Please share any additional comments you have on curriculum and assessment.**

The Learned Societies' Group has not provided an answer to this question.

Comments and Questions
Section 3 *Roles & Responsibilities*

8.1. **There is clarity on where the responsibilities for the strategic direction, review and updates for Curriculum for Excellence lie.**

[Strongly Agree/Agree/Neither Agree/ Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

8.2. **Please indicate where you think the responsibilities for the strategic direction, review and updates for Curriculum for Excellence should lie.**

33 The notion of fragmented, unclear ownership of the curriculum is prevalent throughout the OECD report. Many bodies and actors exist whose role in curriculum design and delivery has not been properly delineated, leading to widespread confusion around respective responsibilities and noticeable gaps in accountability. These are systemic and structural problems that will need to be remedied before sustained ground-level improvements can be enacted.

34 CfE was never evaluated nor piloted in the early stages of its implementation and so there was never an opportunity to identify and rectify issues before they became embedded in the system. It is recommended that any further changes are subjected to regular independent evaluation, not only to prevent problems becoming entrenched but also to capitalise upon proven successes. This will necessarily involve the collection of robust and comprehensive baseline data, which is currently lacking in Scotland.

35 Any reviews need to be methodical rather than scattershot to ensure all aspects are adequately covered. International examples have illustrated the benefits of a more planned, cyclical approach to curriculum and assessment development, which helps to avoid some of the aftershocks of periodic curriculum upheavals while still allowing for measured, meaningful change. A similar approach might prove suitable for Scotland, particularly if it involves some

piloting of proposed changes. A stable curriculum review cycle will allow teachers to focus on teaching and learning issues, especially the gradual iterative improvement in teaching and learning approaches and resources, rather than being continually distracted by changes in assessment and qualifications as has been the case in Scottish secondary schools for almost the last decade.

9.1. **There is clarity on the roles played by national agencies and other providers for responding to needs for support with curriculum and assessment issues.**

[Strongly Agree/Agree/Neither Agree/ Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

9.2. **Please share which aspects of the support currently provided by national agencies and other providers is working well.**

The Learned Societies' Group has not provided an answer to this question.

9.3. **Please indicate where you think greater clarity is needed in relation to the roles played by national agencies and other providers for responding to needs / requests for support with curriculum and assessment issues.**

36 There is a lack of support across the "middle" of the system, which is instrumental in facilitating the implementation of various aims on the ground (e.g. in providing access to subject-specific career-long professional learning). An example would be the Regional Improvement Collaboratives (RICs). As the OECD report itself noted, the potential of the RICs as a support mechanism has not been fully realised. There is a need to invest in professional learning and capacity building that would bolster this middle level to improve the capability of the system overall, alongside an emphasis on high-quality CLPL for teachers, including subject-specific CLPL.

10.1. **There is clarity on where high quality support for leadership and professional learning can be accessed to support practitioners.**

[Strongly Agree/Agree/Neither Agree/ Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

10.2. Please share any comments you may have on support for leadership and professional learning.

37 Both within the OECD report and Scottish Government's response to it, there is no mention of the subject-specific support that would be necessary to improve the capacity of teachers in curriculum making within their subject areas and who should be tasked with delivering it. RICs are specifically mentioned by the Scottish Government as a support mechanism but the OECD report suggests classroom teachers have yet to receive much benefit from them in practice.

38 It is recognised that teacher expertise has the greatest effect on student achievement in the STEM subjects.[12] It is therefore vital that practitioners are supported in developing the knowledge and self-assurance to deliver engaging, inspiring, and inclusive STEM teaching that primes pupils to be successful in these subjects. This is particularly true among primary teachers.

39 Past reports by Education Scotland have shown that STEM teaching in the primary years can be hampered by a lack of confidence. ITE entrants are not required to have a science qualification in order to be accepted into teaching programmes and a significant proportion of primary school teachers report a lack of confidence in their ability to teach STEM subjects – particularly engineering and technology – which may have implications for the depth of learning that can take place. As such, there is a risk that pupils leave primary school less prepared to study these subjects at secondary school level. Recognising there are already exemplars of good practice, ensuring that core STEM concepts are adequately covered across all ITE programmes in Scotland would help to ensure that all primary teachers have the requisite knowledge and understanding to deliver high-quality STEM experiences. However, these positive impacts will only become apparent over the longer term. In the short term, the LSG recommends that CLPL is made widely accessible and promoted across the system in order to build capacity in STEM teaching at the primary school level. Such CLPL should also include opportunities for subject-specific learning.

40 Scottish Government should support networks where universities share education research with teachers as there is currently no clear mechanism to facilitate teachers keeping up to date with such research. The LSG could also offer its assistance in this regard by mobilising groups of teachers – and indeed the wider subject community – to share expertise, as well as bridging the gap between practice and research.

41 As part of the STEM Education and Training Strategy, further education partnership hubs were established. We wonder whether these are sufficiently resourced, adequately coordinated, and if there is sufficient data on their efficacy.

42 The future of qualifications and assessments in Scotland is very much a live issue and it is possible that significant changes could be introduced. Some teachers are more confident than others in their assessment capabilities and it will be important to ensure that all teachers are supported in developing this skill, particularly if assessment moves further into the classroom and a wider range of assessment options is introduced. This will also give rise to good quality debate about more fundamental aspects of teaching and learning. This goes back to the point about building a strong "middle" to the system that could assist with this capacity building.

11.1. There is sufficient trust with all stakeholders, including children, young people, parents & carers, so they are genuinely involved in decision making.

[Strongly Agree/Agree/Neither Agree/Disagree/ Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

11.2. Please share any ideas you may have on how trust and decision making can be further improved.

43 Beyond the obvious need to engage with children, young people, parents, and carers, it will also be important to engage with employers, tertiary education institutions, and other relevant stakeholders in any decision making.

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12 Coe, R., Aloisi, C., Higgins, S., & Major, L.E. (2014). *What makes great teaching? Review of the underpinning research.* Sutton Trust. https://www.suttontrust.com/wp-content/uploads/2014/10/What-Makes-Great-Teaching-REPORT.pdf

44 The OECD reported that teachers did not consider themselves as having been adequately involved or that their voices were heard in the implementation of CfE. Any future reforms must genuinely involve practising teachers at every stage to ensure that information about the realities of the classroom inform decision-making. Ultimately all curriculum development depends on teacher development and on the teaching profession being fully on board with these developments.

12.1. Independent inspection has an important role to play in scrutiny and evaluation, enhancing improvement and building capacity.

[Strongly Agree/Agree/Neither Agree/ Disagree/Strongly Disagree]

The Learned Societies' Group has not provided an answer to this question.

12.2. Please give examples of how you would like to see scrutiny and evaluation being carried out in future.

45 Some would argue that the system is currently being driven largely by an accountability agenda, both through the inspectorate but also in the form of high-stakes examinations. There could be scope for Scotland to set up a more supportive quality-assurance system. This could involve a potentially increased role for local authorities and RICs with an emphasis on supporting the teaching profession to use its professionalism to improve pupil outcomes. It will be important to consider how the restructuring of Education Scotland could impact upon other support-providing educational partners including local authorities/RICs.

13. Please share any additional comments on roles and responsibilities in Scotland's education system.

The Learned Societies' Group has not provided an answer to this question.

Comments and Questions

Section 4 *Replacing the Scottish Qualifications Authority and reforming Education Scotland*

14. Please share any comments or suggestions you have on this proposed reform below.

We are particularly interested in hearing your views on:

a) **the approach this reform should take (for example what form should this agency take)**

b) **the opportunities these reforms could present (for example the development of a new national approach to inspection including alignment with other scrutiny functions)**

c) **the risks associated with any reform (for example whether the independence of the inspectorate could be jeopardised by change)**

d) **how any risks might be mitigated**

e) **the timescales over which these reforms should take place.**

The Learned Societies' Group has not provided an answer to this question.

15. Please share any comments or suggestions you have on how the functions currently housed in Education Scotland could be reformed.
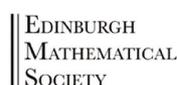
We are particularly interested in hearing your views on:

a) **the approach this reform should take (for example which functions should continue to sit within a reformed Education Scotland and are there any functions which could be carried out elsewhere)**

b) **the opportunities reform could present (for example should more prominence be given to aspects of Education Scotland's role)**

c) **the risks associated with any reform (for example disruption of service to education establishments and settings)**

d) **how any risks might be mitigated**

e) **the timescales over which these reforms should take place.**

The Learned Societies' Group has not provided an answer to this question.

12 Coe, R., Aloisi, C., Higgins, S., & Major, L.E. (2014). What makes great teaching? Review of the underpinning research. Sutton Trust. https://www.suttontrust.com/wp-content/uploads/2014/10/What-Makes-Great-Teaching-REPORT.pdf

16. **Please share any comments or suggestions you have on this proposed reform below.**

    We are particularly interested in hearing your views on:

    a) **the approach this reform should take (for example could a function be carried out elsewhere)**

    b) **the opportunities these reforms could present (for example should more prominence be given to an aspect of SQA's role)**

    c) **the risks associated with any reform (for example loss of income, confusion as to system of awards in Scotland)**

    d) **how any risks might be mitigated**

    e) **the timescales over which these reforms should take place**

    The Learned Societies' Group has not provided an answer to this question.

17. **Please share any comments or suggestions you have on this proposed reform below.**

    We are particularly interested in hearing your views on:

    a) **the approach this reform should take (for example are there alternative models for this reform?)**

    b) **the opportunities these reforms could present (for example what should the role of the new agency be?)**

    c) **the risks associated with any reform**

    d) **how any risks might be mitigated**

    e) **the timescales over which these reforms should take place**

    The Learned Societies' Group has not provided an answer to this question.

Additional Information

For further information, please contact Daria Tuhtar (dtuhtar@therse.org.uk).