RSE

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EMBEDDING INTERDISCIPLINARY LEARNING IN SCOTTISH SCHOOLS

Interdisciplinary learning (IDL) is crucially important to addressing current and future societal challenges, including climate change.

While IDL is a distinctive and innovative feature of Curriculum for Excellence, its development in our schools has been patchy.

Key barriers to embedding IDL include: a lack of understanding as to what it is; its low profile compared to other education priorities; cultural, including a focus on subject specialism, and logistical, including timetabling; and how to assess it.

IDL development can be supported by: building on the refreshed CfE narrative and parallel activity to clarify IDL; providing practical advice, exemplification and guidance to teachers, and supporting teacher collaboration; harnessing the resource and expertise within the Regional Improvement Collaboratives (RICs) to build capacity in IDL; embedding IDL within teachers' professional review and development and professional update processes; and researching and evaluating IDL approaches.

Summary

Interdisciplinary learning (IDL) is a way of learning and thinking that draws on knowledge and understanding from two or more disciplines in order to gain new knowledge and skills, understand issues, and explain or solve problems that are beyond the scope of any single subject. This is becoming increasingly important as the most significant challenges, advances, innovations and discoveries in the world today and envisaged in the future are at the interface of disciplines, including climate change, globalisation, sustainability, demographic change and digitalisation. Scottish education at all levels needs to reflect these interlinked realities. IDL must be grounded in disciplinary knowledge and understanding, since it is the disciplines that give structure and rigour to the development and understanding of knowledge. Without the disciplinary 'pillars', the interdisciplinary 'lintels' will fall.

IDL is one of the most distinctive and innovative features of Curriculum for Excellence (CfE). Despite IDL being an explicit context for learning within CfE, it has not yet been widely developed in our schools. The lack of conceptual clarity about what constitutes IDL is the most pressing issue to be addressed if IDL is to be fully realised and embedded within Scottish school education. It is crucially important that there is a shared understanding among teachers of what IDL is.

The launch of the refreshed CfE narrative provides a timely means of clarifying IDL and raising its profile among teachers and school leaders. To do so, the refreshed narrative will need to be accompanied by resources and support to help translate IDL into practical reality. For its part, the RSE is coordinating the establishment of a practitioner-led, principally online forum on IDL that will support professional dialogue and collaborative professional development among teachers and teacher educators, as well as the development, sharing and curation of high-quality practical IDL resources.

The Regional Improvement Collaboratives (RICs) in collaboration with teachers, school leaders and teacher educators have a very important role in supporting IDL. The RICs can bring to bear expertise, capacity and resources that extend beyond those available within individual local authorities. The RICs could be very well placed to help embed IDL within curriculum practice by providing clear and practical guidance, supporting collaborative approaches and the development of meaningful learning networks. To achieve this, all of the RICs should build collaborative relationships with teacher educators in Scotland's Schools of Education.

The assessment of IDL is a major, complex challenge and it is one that will have to be addressed if IDL is to feature prominently in school education. Clear criteria will be required about what it is within IDL that will be assessed. IDL does not easily lend itself to straightforward assessment and creative assessment methods will need to be researched and developed to support its delivery.

The subject-based National Qualification courses and assessments are a barrier to the development of IDL within secondary schools. The Scottish Baccalaureate, which includes an interdisciplinary project, is the only SQA qualification that formally recognises IDL. This means that the vast majority of learners will receive very limited, if any, exposure to formally recognised IDL within the senior phase of CfE. The RSE recommend that SQA should take forward the commitment made by Dr Janet Brown, then SQA Chief Executive, at the RSE IDL conference to explore how IDL can be introduced at an earlier stage of the senior phase qualifications.

While the General Teaching Council for Scotland (GTCS) Professional Standards for Registration recognise that teachers need to be able to develop IDL, there is a need to clarify how the Standards operate in practice to ensure that IDL is understood by all teachers and actively incorporated into their classroom practice. The RSE recommend that the GTCS should use its current review of the Standards to ensure that IDL is included in the Standard for Career-Long Professional Learning. This would go some way to ensuring that engagement with IDL is embedded within Professional Review and Development and Professional Update processes.

Independent academic research and evaluation is needed in order to generate a fuller understanding of IDL implementation and its impact on learners. The Scottish Government's Research Strategy for Scottish Education provides a framework for supporting potential research into IDL. As a distinctive and innovative, yet not fully understood aspect of CfE, the RSE strongly believe that research into IDL in Scottish education should be prioritised by the strategy.

While this advice paper focuses on IDL at school, IDL understanding, development and implementation is a systemic challenge requiring a coordinated response across Scotland's education and skills system, including further and higher education.

Summary

Background

1 The Royal Society of Edinburgh (RSE), Scotland's National Academy, has, in partnership with others, sought over many years to raise the profile of interdisciplinary learning (IDL) in Scottish education, especially at primary and secondary school levels. While IDL is an explicit context for learning within Curriculum for Excellence (CfE), it has not yet been widely developed or embedded in school practice.[1] We recognise that there are positive examples of IDL being successfully implemented in schools, but in others it is clear that there has been little or no coordinated IDL development, indicating sporadic implementation at best.

2 It was for these reasons that the RSE's Education Committee[2] decided to hold its first major full-day conference in January 2019 on the topic of IDL in education. This brought together policy makers and influencers, practitioners, learners and employers, and combined insights from leading international figures and practical wisdom and experience from closer to home. The conference considered: what IDL is; the importance of IDL for addressing major societal and global challenges; how IDL is currently being developed and delivered in Scotland and in other education systems; the main challenges to implementing IDL; and how teachers and schools can be supported to deliver IDL.[3]

3 This advice paper aims to set out the conditions and actions needed to embed IDL in Scottish school education by drawing upon the conference outputs and outcomes as well as the existing literature relating to IDL in Scottish education. The RSE would be pleased to continue to work with practitioners, schools, parents, Scottish Government, Education Scotland, SQA, Regional Improvement Collaboratives, local authorities, General Teaching Council for Scotland, colleges, universities, unions, employers and others to support the development and delivery of IDL.

What is IDL and why is it important?
What is IDL?

4 IDL is a way of learning and thinking. In IDL, learners draw on knowledge and understanding from two or more disciplines in order to gain new knowledge and skills, understand issues, and explain or solve problems that are beyond the scope of any single subject. Successful IDL must be grounded in disciplinary knowledge and understanding, since it is the disciplines that give structure and rigour to the development and understanding of knowledge. Without the disciplinary 'pillars', the interdisciplinary 'lintels' will fall. IDL does not take place at the expense of subject learning but should complement and enrich subject learning while facilitating learning beyond subject boundaries. The principles and practice of IDL apply across all areas of the curriculum. Fundamental to successful interdisciplinary teaching and learning is the vital capacity to transfer and apply disciplinary knowledge, understanding and skills to new problems and into other areas of learning. IDL also requires teamwork and collaboration among people from two or more disciplines, a practice common in the workplace; education should reflect such practice.[4]

Why is it important?

5 *Breadth* of knowledge and skills are the keys to translating creativity, curiosity and innovation into economic growth and employment. The OECD is undertaking a project that aims to support countries to answer the following two questions: *What knowledge, skills, attitudes and values will today's students need to thrive and shape their world in 2030?; and How can instructional systems develop such knowledge, skills, attitudes and values effectively?*[5] This demonstrates the fundamental importance of identifying what sorts of knowledge should constitute CfE so as to ensure that learners can navigate an increasingly complex world.

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1 Building the Curriculum 3: A Framework for Learning and Teaching sets out the four contexts for learning within Curriculum for Excellence: Curriculum Area & Subjects, Interdisciplinary Learning, Ethos and Life of the school and Opportunities for Personal achievement.

2 More information about the RSE Education Committee is available at: https://www.rse.org.uk/policy/standing-committees/education-committee/

3 The RSE IDL conference report and other outputs are freely available from the RSE website at:
https://www.rse.org.uk/event/interdisciplinary-learning-creative-thinking-for-a-complex-world/

4 Further information about what interdisciplinary learning is and the distinction between IDL and other forms of learning, including multidisciplinary and cross-curricular is provided in: *Pillars and Lintels: The What's, Why's and How's of Interdisciplinary Learning*, RSE, 2017
http://www.rse.org.uk/wp-content/uploads/2018/02/IDL_pillars_and_lintels_paper-1.pdf

5 The Future of Education and Skills Education 2030, OECD https://www.oecd.org/education/2030-project/

6 IDL enables us to advance our understanding of a subject or problem that extends beyond the scope of a single discipline. It opens up different ways of seeing the world and identifying new questions to ask about it. This is becoming increasingly important as the most significant challenges, advances, innovations and discoveries in the world today and envisaged for the future are at the interface of disciplines, including for example climate change, globalisation, sustainability, demographic change and digitalisation. Scottish education needs to reflect these interlinked realities.

7 A new and higher-level interdisciplinary knowledge and skills base will be essential to meet these complex challenges, with a shift or rebalancing away from an emphasis on narrowly focussed specialists towards flexible individuals with continuous access to lifelong interdisciplinary education and training.

8 The OECD's Skills Strategy identifies higher order skills, including complex problem solving, critical thinking, teamwork, resilience and adaptability, as those that people will require to thrive in the workplace and in modern societies. It also makes clear the scale of the systemic change needed, particularly to school curricula, teacher education and development.[6] Skills Development Scotland and the Centre for Work-Based Learning have reported on Scotland's skills needs in the light of technological and societal developments and a future that is increasingly unpredictable.[7] This reinforces the need for learners to be equipped with the higher order skills that they will need to thrive in an uncertain world. Their report makes clear that a more radical shift is required in our education and skills system to meet future needs, with closer cooperation required between Scotland's education and skills providers and employers.

9 Recruiters are increasingly seeking to employ those with breadth of knowledge, skills and problem-solving capabilities rather than subject specialists. Survey work undertaken by the Institute of Student Employers, an employer-led

membership organisation, supports this with 82% of graduate recruiters reporting that they do not mind what degree subjects candidates have.[8] Rather, employers place a greater value on the attributes and skills developed by students, including communication, interpersonal and technical skills.[9]

Addressing the challenges to implementing IDL in schools
Conceptual clarity

10 The lack of conceptual clarity about what constitutes IDL is the most pressing issue to be addressed if IDL is to be fully implemented within Scottish school education. Interdisciplinary learning is often widely used (and misused) as a general term for the various types of learning, including, for example, multidisciplinary learning, that involve the wider use and application of disciplinary knowledge. However, simply linking or juxtaposing discrete subjects together is not by itself interdisciplinary. As we have set out above in the explanation of what is IDL, it critically involves recontextualising and applying knowledge and skills from two or more disciplines in a purposeful way to advance learners' understanding and/or solve problems beyond the scope of a single discipline.

11 We recognise that teachers and schools may use various terms to describe IDL, including project-based, thematic, integrated and problem-based learning. While the development and delivery of IDL needs to avoid becoming fixated on prescriptive terminology and definitional detail, it is crucially important that there is a shared understanding among teachers of what IDL is. Otherwise, teachers and schools may mistakenly believe that their approaches are interdisciplinary when they are not, or they provide IDL experiences that they do not fully capitalise on.

6 OECD Skills Strategy 2019, Skills to Shape a Better Future, OECD, May 2019
http://www.oecd.org/skills/oecd-skills-strategy-2019-9789264313835-en.htm

7 Skills 4.0: A skills model to drive Scotland's future, Skills Development Scotland and the Centre for Work-Based Learning in Scotland, February 2018
https://www.skillsdevelopmentscotland.co.uk/media/44684/skills-40_a-skills-model.pdf

8 Annual Survey 2017 Report; Key trends and issues in student recruitment 2016-2017, Institute of Student Employers

9 The Global Skills Gap in the 21st Century, QS Quacquarelli Symonds and the Institute of Student Employers, 2018
http://info.qs.com/rs/335-VIN-535/images/The%20Global%20Skills%20Gap%2021st%20Century.pdf

12 It is unsurprising that the overarching challenge to the implementation of IDL is the lack of common understanding and of clarity as to what constitutes IDL.[10] While the Building the Curriculum (BtC) series of guidance documents published by the Scottish Government, notably BtC 3, refer to interdisciplinary learning, they do so briefly, in high level and under-developed terms.[11] In contrast, BtC set out advice on the contribution of subject areas which it could be expected that teachers would be familiar with. Given that IDL can be considered one of the most distinctive and innovative features of CfE, it is very unfortunate that more in-depth guidance and support for teachers on IDL was not developed in parallel with the launch of CfE. Education Scotland attempted to address this by publishing an IDL guide for practitioners in 2012.[12] However, in 2015 the Building Our Curriculum Self-Help Group (BOCSH), an informal grouping of headteachers and school managers, in its advisory report on IDL in schools, described IDL as having been consigned to 'official obscurity'.[13] The recent launch of the refreshed narrative for CfE is another attempt to draw renewed attention to core components of CfE, including IDL. We comment on this under the leadership and support structures section, below.

13 The lack of clear guidance and conceptual understanding has resulted in many schools adopting a piecemeal approach to IDL, with much that passes as IDL not genuinely interdisciplinary because it fails to draw upon knowledge from two or more disciplines in an integrated way. This has included somewhat contrived attempts whereby schools have sought to shoehorn content into one-off themed IDL days or weeks.

14 The continued lack of understanding among teachers of what constitutes IDL and its patchy development in schools demonstrate that teachers require clear, high-quality guidance and support on what constitutes IDL, how it relates to subjects and curriculum areas, why it is important for learners, and about how it can be planned, exemplified, developed and implemented. The RSE would be pleased to work with partners in helping to address this.

IDL in Primary and Secondary schools

15 The Broad General Education (BGE) phase of CfE, beginning in early learning and childcare and extending through to the end of S3 is, in principle, well-framed to support IDL, since it is supposed to provide breadth and depth of learning within and across the eight curriculum areas of expressive arts, health and wellbeing, languages, mathematics, religious and moral studies, sciences, social studies and technologies.

16 As well as the need to address the lack of conceptual understanding of IDL among the teaching workforce, it is important to consider the distinctive issues for the development and delivery of IDL at primary and secondary schools. Primary teachers are expected to work across the curriculum in a collegiate way. This can support the joint planning of learning activities and thereby provide a platform for implementing IDL. However, one teacher is usually expected to cover all subject disciplines. This can present a significant challenge since primary teachers may not have the disciplinary knowledge and confidence that IDL requires. We also recognise that there are a range of areas that primary schools are expected to prioritise, including literacy and numeracy, modern languages, health and wellbeing and Learning for Sustainability, which may constrain the time and space needed for well-planned IDL. It should, however, be noted that some of these current priorities lend themselves to IDL approaches.

17 In contrast, while secondary school teachers have the disciplinary expertise, a range of factors, including logistical and cultural, act as a barrier to delivering IDL within secondary settings. At the logistical level, a lack of time and the inflexibility of school timetabling can constrain the capacity of secondary teachers to undertake the cross-departmental collaboration that is required to design and deliver properly planned IDL. The cultural problem is even greater with an overriding focus on subject specialism within secondary schools. As a result, schools and teachers may not recognise the importance and value of IDL and, in some cases, subject specialist teachers may perceive IDL to be a threat to their subject, even though IDL needs a strong disciplinary underpinning.

10 See, for example, analysis of conference delegates' responses to RSE IDL conference questionnaire
https://www.rse.org.uk/wp-content/uploads/2018/10/RSE-IDL-Conference-Questionnaire-2019.pdf

11 Building the Curriculum document series
https://education.gov.scot/education-scotland/scottish-education-system/policy-for-scottish-education/policy-drivers/cfe-building-from-the-statement-appendix-incl-btc1-5/building-the-curriculum/

12 Interdisciplinary Learning; A Guide for practitioners; CfE Briefing 4, Education Scotland, 2012
https://education.gov.scot/Documents/cfe-briefing-4.pdf

13 Interdisciplinary Learning, BOCSH, 2015 https://issuu.com/bocshgroup/docs/bocsh_idl_jan_2015

18 A barrier to the development of IDL at secondary school level, as highlighted from our conference, is the focus on National Qualification courses. Scotland's National Qualifications are largely subject-based, which results in IDL being neglected in the senior phase (S4-S6) since it is considered a low priority by many schools when it comes to preparing learners for subject-based qualification courses. In addition, ongoing reform and redevelopment of qualification courses and assessments has been a national priority over many years, meaning that IDL has received little policy or educational attention, especially within the senior phase. We comment more fully on IDL and assessment in the next section of this paper.

19 In addition, it is notable that there is currently a lack of reliable information on secondary schools' curriculum models and how they impact on learner attainment. This includes concern about the extent to which schools' curriculum structures are underpinned by clear rationales and appropriate curriculum design. These factors may, in part, have contributed to IDL being afforded low priority at secondary school level.

20 Robust data and analysis are required on curriculum models and their impact. A new two-year research project being undertaken by the University of Stirling, funded by the Nuffield Foundation, aims to fill gaps in the data and explore the impact of CfE on learners, including developing a better understanding of how curriculum is made in schools. The RSE is represented on the research project advisory board.

Supporting Schools and Teachers to develop and deliver IDL
Leadership and Support structures

21 In order to address the issues raised in this paper, leadership at all levels of the education system will be required to ensure that IDL is embedded within Scottish school education. In its review of Scottish school education, the OECD recommended that the Scottish Government should create a new narrative for CfE as a means of restating longstanding aims and helping to ensure that the core principles of CfE, including the four contexts for learning, which encapsulate IDL, are translated into curricular practices.[14] A refreshed narrative has been developed by a working group of the Scottish Government's Curriculum and Assessment Board. Launched in September 2019, the refreshed narrative is designed to be a single entry point to help schools and teachers to develop practice that supports the core principles and innovative aspects of CfE.[15]

22 This development is a very timely opportunity to raise the profile of IDL among teachers and school leaders, clarifying IDL as a concept and providing practical advice and support to guide teachers on its development and delivery. However, given that the narrative primarily restates the existing BtC text on IDL, this, on its own, will not to lead to an upturn in IDL delivery in schools. The narrative on IDL will need to be supplemented with practical support.

23 The RSE would be pleased to work with Scottish Government, Education Scotland and other partners to ensure that the new narrative supports teachers to embed IDL within curriculum practice through practical, collaborative approaches, meaningful learning networks and meeting learning and support needs. Education Scotland's commissioning of three workshops in early 2020 that aim to build IDL understanding and capacity among 40 teachers and school leaders is a welcome first step. The challenge will be scaling-up and rolling-out the learning from these sessions to all schools in Scotland.

24 There is a responsibility on local authorities and school leadership teams to ensure that IDL is understood and recognised as being integral to the successful implementation of CfE. As part of this, local authorities and schools need to encourage and support a culture of collaboration across disciplinary boundaries both within and across schools and school clusters. To facilitate this, primary and secondary school teachers need to be provided with the time to think, plan and collaborate to develop IDL.

14 Improving Schools in Scotland: An OECD Perspective, OECD, 2015
https://www.oecd.org/education/school/Improving-Schools-in-Scotland-An-OECD-Perspective.pdf
15 Curriculum for Excellence Narrative, September 2019 https://scotlandscurriculum.scot/

25 While still at an early stage of development, the six Regional Improvement Collaboratives (RICs) could have a very important role to play in support of IDL by providing teachers and schools with curriculum leadership and design support, including bringing to bear expertise, capacity and resources that extend beyond those available within individual local authorities. The RICs could be very well placed to adopt and provide clear practical guidance and support that conceptualises IDL and development programmes to help teachers make sense of these concepts and to enact practice accordingly. Currently, as far as we are able to tell, the existing Regional Improvement Plans do not make reference to IDL. This highlights the need for IDL to be given much greater prominence in guidance and priority at both national and regional levels.

26 We are, however, aware of developments within some of the RICs to support teachers in curriculum making, focussing on content, pedagogy, infrastructure and assessment. Activity of this kind is well placed to bring renewed focus to IDL. This development seems to be driven by committed headteachers and teachers working with teacher educators. In supporting IDL it will be important to build connections between the RICs, headteachers and teacher educators in Scotland. While we understand this is happening in some of the RICs, this does not seem to be universal at present. We strongly encourage all of the RICs to build relationships with the Schools of Education in Scotland's universities.

27 While guidance and support from Scottish Government, national agencies and local authorities is necessary to ensure that IDL is given greater prominence, there is a parallel need to provide teachers with the means to support themselves and one another to develop and deliver IDL. While there exist already a range of Scotland-wide online subject specialist networks for teachers, there is currently no national equivalent for IDL. There was support for an IDL teacher forum from practitioners and teacher educators who attended the RSE

IDL conference.[16] The RSE is coordinating the establishment of a practitioner forum on IDL that will support professional dialogue and collaboration among teachers and teacher educators, as well as the development, sharing and curation of high-quality practical IDL resources. We have brought together teachers and teacher educators to take forward the development of the IDL forum and we would be pleased to hear from those who would be interested in contributing to it.

Exemplification

28 Building on the preceding points, exemplification of IDL is a high priority in communicating the principles and practice of IDL to learners and teachers in order to promote a clear understanding of what IDL is, the benefits it can confer on learners and some of the big ideas that interest and excite learners by providing real world relevance. Little by way of sufficiently detailed and widely available practical exemplification of IDL that demonstrably matches key IDL criteria yet exists. To address this, teachers and schools need to be provided with high-quality, practical IDL exemplar resources that draw meaningfully on all areas of the curriculum.

29 The development of exemplar resources that teachers can draw upon need not stifle teacher and learner creativity. Rather, exemplars would help demonstrate approaches that teachers can use to plan for and deliver IDL in their settings. There are clear links to be made here with the refreshed CfE narrative that will need to be accompanied by resources and support to help turn-key aspects of CfE, including IDL, into practical reality. The RSE has contributed to previous CfE exemplar resources commissioned by Education Scotland, notably for Chemistry and Computing Science, and we would be pleased to discuss with partners how IDL can be supported in this way. There is scope to build upon the wide-ranging IDL exemplifications displayed in the posters that were exhibited at the RSE conference[17] as well as the approaches to IDL that are being showcased by the General Teaching Council for Scotland (GTCS) in its Teaching Scotland Magazine.[18]

16 Migration Advisory Committee, Full review of the Shortage Occupation List, p335
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/806331/28_05_2019_Full_Review_SOL_Final_Report_1159.pdf

17 Posters exhibited at RSE IDL Conference
https://www.rse.org.uk/wp-content/uploads/2018/10/RSE-IDL-Conference-Posters-2019.pdf

18 See, for examples: Teaching Scotland, Issue 79, May 2019 http://www.gtcs.org.uk/News/teaching-scotland/79-breaking-down-walls.aspx
and Teaching Scotland, Issue 81, November 2019 http://www.gtcs.org.uk/News/teaching-scotland/81-cooking-up-idl-at-harrysmuir-primary-school.aspx

Assessment

30 The need to develop meaningful ways in which IDL can be assessed is a major, complex challenge and it is one that will have to be addressed if IDL is to feature prominently in school education. Assessment of IDL relates not only to senior phase qualifications but also, crucially, to gaining an understanding of learners' progress in IDL during the BGE. Clear criteria will be required about what it is within IDL that will be assessed. IDL does not easily lend itself to straightforward assessment and creative assessment methods will need to be researched and developed to support the implementation of IDL.

31 The BOCSH report concluded that successful accreditation of IDL would be a major motivation for its credibility and delivery.[19] Currently, however, the Scottish Baccalaureates in Expressive Arts, Languages, Science and Social Sciences (all at SCQF level 7), which includes an interdisciplinary project as a mandatory component, is the only SQA qualification that formally recognises IDL. However, the low uptake[20] and issues relating to schools' capacity to offer the Baccalaureate means that most learners are likely to have very limited exposure to formally recognised IDL within the senior phase.

32 It is also possible to take the interdisciplinary project unit of the Baccalaureate as a standalone qualification although few do so. Where candidates present for the project on a standalone basis the majority do so because they have been withdrawn from the Baccalaureate.[21] The low uptake could, in part, be related to the extent to which the Scottish Baccalaureate and specifically the IDL project unit, is valued by Higher Education institutions. As well as promoting more widely to schools the availability of the interdisciplinary project as a freestanding qualification and working with Scotland's Higher Education institutions to increase the visibility and credibility of the IDL project unit, the RSE recommend that the SQA should take forward the commitment made at the RSE IDL conference by Dr Janet Brown, then SQA Chief Executive, to explore how IDL can be brought into the senior phase qualifications at an earlier point.

Teacher Education and Career-Long Professional Learning

33 The GTCS Professional Standards for Registration specifically recognise that both student teachers and registered teachers need to be able to develop and deliver IDL, with the GTCS Memorandum on Entry Requirements making clear that secondary school subject specialists are expected to contribute to the teaching of IDL.[22] While the Professional Standards provide a means of highlighting from the outset of a teacher's career the importance of IDL, they do not address how judgements will or should be made in respect of the extent to which teachers are meeting them. There is therefore a need for clarification on how the Professional Standards operate in practice to ensure that IDL is understood by all teachers and actively incorporated into their classroom practice.

34 The preceding text also makes clear the need to ensure that IDL features prominently within initial teacher education (ITE) programmes. Working with the Scottish Council of Deans of Education, the GTCS should review how IDL is being developed within ITE. As well as making sure that time and space are being devoted within ITE to discourse relating to the nature of and ways to facilitate IDL thinking and learning, it would also be a way of capturing and disseminating good and innovative approaches to IDL.

19 Interdisciplinary Learning, BOCSH, 2015 https://issuu.com/bocshgroup/docs/bocsh_idl_jan_2015

20 There were fewer than 160 entries for the SQA Scottish Baccalaureate in 2018/19

21 SQA desk-based research on the IDL project unit, 2017

22 The Standards for Registration, GTCS, 2012
http://www.gtcs.org.uk/web/FILES/the-standards/standards-for-registration-1212.pdf
Memorandum on Entry Requirements to Programmes of Initial Teacher Education in Scotland, GTCS, September 2019
http://www.gtcs.org.uk/web/FILES/about-gtcs/memorandum-on-entry-requirements-to-programmes-of-ite-in-scotland.pdf

35 Since ITE represents the starting point in teachers' career development, it is crucially important that teachers are able to access high-quality and continuous career-long professional learning to support their ongoing professional development. The GTCS is currently reviewing the Professional Standards applicable to teachers, including that relating to Career-Long Professional Learning, with a view to introducing refreshed standards in June 2020.[23] The purposes of this Standard include signposting areas for professional development and providing a focus for professional learning to deepen teachers' professional knowledge. Through the review the GTCS should examine whether this Standard could be strengthened by including explicit reference to IDL development. While this Standard refers to teachers being able to demonstrate deep subject knowledge, currently there is no explicit recognition given to the value of IDL. This is despite IDL aligning closely with core areas covered by the Standard, including pedagogy and learning; curriculum and assessment; enquiry and research; and educational contexts and current debates in policy, education and practice. Using the Standard to highlight the importance of IDL would, in turn, go some way to ensuring that IDL is embedded within Professional Review and Development and Professional Update processes.

36 Scotland's universities and the GTCS have been working together to develop new, innovative routes into the teaching profession. This includes a move towards developing specialist teachers for the BGE who are able to teach across the primary-secondary transition. This would appear to be a very useful development in helping to support the development of IDL at both primary and secondary school levels. It would give primary schools greater access to subject specialists to underpin IDL while providing for a more innovative approach to learning and teaching in the early years of secondary.

Research and Evaluation

37 The published evidence, relatively modest as it is, in addition to more informal evidence gathering, offers good evidence for the positive impact of IDL on learners' attainment, engagement and attitude, and the contribution to teacher fulfilment and satisfaction.[24] The available literature indicates that successful delivery of IDL depends on a range of factors, including: the skill and knowledge of teachers; effective collaboration across discipline boundaries; consensus across the teaching team about what interdisciplinarity means and how to achieve this; and combining a strong sense of disciplinary identity with a willingness to 'move outside disciplinary boundaries' and engage in interdisciplinary thinking and dialogue.

38 Responses to our conference questionnaire indicate that IDL, where delivered, is in many cases not currently being evaluated or it is being evaluated in diverse but limited ways, involving, for example, questionnaires, focus groups, pupil or teacher evaluation, learner engagement, direct observation, pupil and staff surveys, impact and attendance.[25] Many or all of these approaches may have a role to play, but there appears to be little or no common strategy for evaluating the impact of IDL.

39 Independent academic research and evaluation is needed if we are to generate a fuller understanding of IDL implementation and its impact on learners. The Scottish Government's Research Strategy for Scottish Education provides a framework for supporting potential research into IDL.[26] As a distinctive and innovative, yet not fully understood aspect of CfE, we strongly believe that research into IDL in Scottish education should be prioritised by the strategy. Potential research questions include: generating an understanding of teachers' knowledge and understanding of IDL; exploring and compiling IDL approaches that teachers have implemented in their schools; ascertaining what professional development teachers already access and what – if any – additional resource or development they assess as being relevant and necessary to enhance their understanding of, and practice in, IDL; and exploring appropriate forms of assessment for interdisciplinary work.

23 Consultation on refreshed Professional Standards and Professional Code for Teachers, GTCS
http://www.gtcs.org.uk/News/news/consultation-on-refreshed-professional-standards-code-teachers.aspx

24 See the review of the literature in Ch 11 on Interdisciplinary Learning in the Final Report of the STEM Education Committee (STEMEC), 2016
https://www.gov.scot/publications/stemec-report-2016/

25 Analysis of conference delegates' responses to RSE IDL conference questionnaire
https://www.rse.org.uk/wp-content/uploads/2018/10/RSE-IDL-Conference-Questionnaire-2019.pdf

26 A Research Strategy for Scottish Education, Scottish Government, 2017
https://www.gov.scot/publications/research-strategy-scottish-education/

Higher Education and IDL

40 While this advice paper focuses on the development of IDL at school, consideration needs to be given to the wider education and skills system in Scotland in relation to how it adopts and influences the development of IDL. Notwithstanding the major advances in interdisciplinary and collaborative research and the fact that there are some positive examples of progress of IDL implementation in Higher Education, the obstacles and challenges to progressing IDL are strikingly similar between Higher Education institutions and schools.[27] This includes a lack of clarity as to what IDL is, the need to break down disciplinary silos, find ways of assessing IDL and overcome logistical and resource issues, including timetabling.

41 Research evidence on the development and implementation of IDL in UK Higher Education institutions report the following as key motivations and drivers for IDL in HE: personal interactions between academics; university or college/faculty strategies; advancement of knowledge, evolution of new disciplines and research directions; funding, accreditation, student satisfaction surveys and rankings; social, cultural and economic trends in education and employment; and the need to align teaching with complex societal issues.[28] The IDL programmes are reported to be prevalent at senior undergraduate and postgraduate levels, implying that most young learners do not currently experience IDL if at all until very late in their education.

42 A notable development is the establishment of the London Interdisciplinary School, effectively an IDL university, which is expected to accept its first cohort of undergraduate students in 2021.[29] It will focus on delivering an interdisciplinary programme to support learners to interact with and tackle real-world problems, building on the popularity of University College London's interdisciplinary Bachelor of Arts and Sciences undergraduate degree (BASc), which has grown rapidly since its inception in 2012.[30] In the context of recent City Region Deal-funded developments in Scotland, there is a real opportunity for new enterprise-led interdisciplinary learning developments in further and higher education. For example, the Edinburgh Futures Institute (EFI) is being developed as a response to the need for creative, connected and radical responses to a rapidly changing world.[31] The EFI, which is due to open in 2021, will include a series of interdisciplinary postgraduate programmes co-created with external partners. It should consider extending its remit to creating new interdisciplinary undergraduate degree programmes.

43 The implementation of IDL requires co-ordinated top-down and bottom-up approaches in order to overcome academic, structural and historical barriers. These points make clear that the understanding, development and implementation of IDL is a systemic challenge that require a coordinated and strategic response encompassing primary, secondary, further and higher education.

27 Wernli, D. and Darbellay, F., Interdisciplinarity and the 21st Century Research-Intensive University, League of European Research Universities (LERU), 2016 https://www.leru.org/files/Interdisciplinarity-and-the-21st-Century-Research-Intensive-University-Full-paper.pdf

28 Lyall C., Meagher L., Bandola J. and Kettle A., Interdisciplinary Provision in Higher Education: Current and Future Challenges, Higher Education Academy, 2015 https://www.advance-he.ac.uk/knowledge-hub/interdisciplinary-provision-higher-education-current-and-future-challenges

29 London Interdisciplinary School https://www.londoninterdisciplinaryschool.org/

30 UCL undergraduate interdisciplinary programme https://www.ucl.ac.uk/prospective-students/undergraduate/degrees/arts-sciences-basc

31 Edinburgh Futures Institute https://efi.ed.ac.uk/

Additional Information

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