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**RSE YOUNG
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Advice Paper

Making Stronger Links:

Inter-Disciplinary Learning in Scottish Schools

Summary

This report recommends clearer signposting of the aims, pedagogical approaches, and historical development of Inter-Disciplinary Learning, along with an improved mechanism to share and commend best practice in this area.

It is recommended that research be conducted in Scotland as to the scope, scale, and impact of Inter-Disciplinary Learning, where it exists in a learner's journey from 3 to 18. In particular, it is recommended that research should focus on if and where Inter-Disciplinary Learning is impacting on learners' progress in literacy, numeracy and health & wellbeing.

The report advocates a series of engagements whereby Primary, Secondary, College and University practitioners are able to collaborate on best practice in their curriculum area, and to share expertise in how they achieve effective learning in planned inter-disciplinary experiences.

The report also recommends an urgent review of Added Value Units¹ within the National qualifications. At present students are undertaking *action learning based assessments* in every subject area which they have chosen to study. This appears to be an example of over assessment. Students could undertake fewer of these assessments whilst at the same time focusing on broader curriculum areas (including

key outcomes from 'responsibility of all' areas of CfE: literacy, numeracy and health & wellbeing). Such an approach would minimise repetition, student disengagement and facilitate a real life inter-disciplinary experience for young people. This is recommended as a possible mechanism to provide opportunities for action research and applicable Inter-Disciplinary Learning. This offers students the opportunity to learn about an issue in depth but by using a breadth of skills and experiences to come to a conclusion or present on findings and research approaches. This approach would not be dissimilar to that already adopted in Scotland and across Europe via the Baccalaureate.

The report recommends a review of curriculum structures and timetables in the Secondary schools to foster activity based research. As a means to enhance Inter-Disciplinary Learning outwith the confines of school classrooms, the group recommends that school timetables allow for occasional extended periods of time for planned Inter-Disciplinary Learning and the proposal that free public transport be provided during the school day is considered. Scotland's rich natural heritage, villages, towns and cities offer a rich tapestry of learning opportunities where students should and could see the nature of Inter-Disciplinary Learning in real life contexts.



Excellence in Education

Through its Curriculum for Excellence Working Group (renamed the Excellence in Education Working Group in 2013), the Young Academy of Scotland identifies, promotes, and supports emerging priorities in Scottish education. The Young Academy provides a platform for the talented and creative members of the rising generation to develop a coherent and influential voice, and to address the most challenging issues facing society in Scotland and beyond. The Young Academy presents opportunities for its members to interact across disciplines and occupations, and to become a more integrated part of the community of decision makers, opinion formers, funding bodies, national institutions, the public and the media within Scotland, the UK and internationally.²

The Excellence in Education Working Group reflects the Young Academy's inter-disciplinary membership with members drawn from science and humanities, the professions, the arts, business and civil society the Collectively and individuals all are keen to support learners and curriculum development in Scotland.

The Excellence in Education Working Group welcomes and endorses the aims and values of CfE and in particular those relating to: the application of learning; learning of relevance to the real world; active learning approaches; developing critical thinking; and creating a creative environment for both learners and education practitioners to promote and enhance learning. Members of the group were interested in the prevalence, scope and impact of Inter-Disciplinary Learning at all stages of a learner's learning from Early Level to the emerging new National Qualifications.

The Foundations of Inter-Disciplinary Learning

Inter-Disciplinary Learning is not a new approach to learning within School, Further, or Higher Education. It would be of benefit to the

current practitioners of Inter-Disciplinary Learning to appreciate the history and context of this approach to learning.

Curriculum for Excellence enables clear links between different aspects of learning to be made. "Building the Curriculum 3: A Framework for Teaching and Learning" documentation in support of the new curriculum explicitly states:

*"The curriculum should include space for learning beyond subject boundaries, so that children and young people can make connections between different areas of learning. Inter-disciplinary studies, based upon groupings of experiences and outcomes from within and across curriculum areas can provide relevant, challenging and enjoyable learning experiences."*³

However, the same document also states:

*"Subjects are an essential feature of the curriculum, particularly in secondary school. They provide an important and familiar structure for knowledge, offering a context for specialists to inspire, stretch and motivate. Throughout a young person's learning there will be increasing specialisation and greater depth, which will lead to subjects increasingly being the principal means of structuring learning and delivering outcomes."*⁴

Guidance

Information provided to teachers on Inter-Disciplinary Learning appears inconsistent and there is very little Scottish based research showing the impact of this approach on learning or its impact on attainment.

Early Years and Primary Sector

The group heard evidence from teachers, teacher educators, education researchers, as well as current and former education leaders who confirmed that most learning in the primary sector was set in inter-disciplinary contexts.

In some cases Inter-Disciplinary Learning is taken as simply 'making connections' between curriculum areas of experiences and outcomes. Such an approach can be risky, fallacious and does not always serve learners' needs either in developing core skills in literacy and numeracy or in developing metacognitive skills enhanced by well planned and executed Inter-Disciplinary Learning.

All parties agreed that effective Inter-Disciplinary Learning happened following well thought out planning related to the Experiences and Outcomes and involving learners in the planning process where possible. The foundation to this was the practitioner understanding the context of Inter-Disciplinary Learning and how this might advance learners' understanding and application of learning further than by study through one discipline area.

Some primary schools adopted retrospective planning tools. Whilst members of the group agreed that learning changes and the framework for learning required to be flexible, it was felt that an urgent review of planning the primary sector in particular must be conducted and guidance issued by Education Scotland with regards to the planning of Inter-Disciplinary Learning. Planning must not be overly cumbersome and bureaucratic. At the same time, planning must be just that: planning. Retrospective self-evaluation is of course essential, but it must be reflective of the plans put in place in the first instance. Those plans must, however, allow flexibility for learning to change direction or experience more depth, breadth and application as learning unfolds.

The group heard that within the primary sector some Her Majesty's Inspectors of Education (HMIe) Reports showed a declining trend in the number of schools receiving good or very good for the quality indicator (The Curriculum). This reflected poor coverage of all curriculum are-

as in some schools; poor curricular transitions arrangements in other schools; and the lack of coherent curricular plan, vision, or rationale, in other schools.

Secondary Sector: Broad General Education (S1 to S3)

The group heard evidence from a range of sources with regards to ongoing practice in Inter-Disciplinary Learning in wide ranging topics. Some of those topics focussed on local or international events such as Homecoming events, the Holocaust and Holocaust Memorial Day and Remembrance Day. Other Inter-Disciplinary learning focussed learners around themes such as crime or science. In one case example we heard that a school had focused learning on a topic and students took part in a Sausage Week. The relevance of this and impact of this learning was questioned by those who took part in consultations. There is still a tension between existing strongholds of subject discipline areas that focus on discrete Experiences and Outcomes, and occasionally the Responsibility for All (RoA) Experiences and Outcomes, and new faculty structures that focus on broader curriculum area Experiences and Outcomes. Furthermore, some schools embark on Inter-Disciplinary Learning periods, days, or weeks. Far fewer schools have Inter-Disciplinary Learning embedded into regular teaching and learning practice.

The group heard evidence including references to other education systems, for example, New Zealand, who have adopted a less fragmented approach to curriculum planning and offer more Inter-Disciplinary Learning by structuring learning to a greater extent around faculties and broad curriculum areas and whose timetables allow for longer learning episodes. More information is required on the success of these approaches in achieving better outcomes for learners.

"The group heard that within the primary sector some HMIe Reports showed a declining trend in the number of schools receiving good or very good for the quality indicator"

National Qualifications

Inter-Disciplinary Learning does not take place as effectively in the senior phase when students undertake qualifications, due to unrelenting demands to complete internal assessments, external course work, and ensure students have covered all outcomes which will be assessed in the final exam. Despite this, opportunities do exist across the curriculum for skills and knowledge to be developed further and students' development of learning applied by working on one area of learning whilst covering two or more outcomes in different national qualifications. It is suggested that an approach or tool is developed which allows students to see both the totality of their learning outcomes required in courses chosen and to see possible matches where skills and knowledge could be complimentary. With many students changing timetables before the end of the summer term and before the actual start of the new academic year it is suggested that exposure to this approach and/or tool happens at this time in order to highlight inter-disciplinary opportunities prior to students actually embarking on the new courses at the start of the following academic year.

Members of the working group agree with the principle of specialisation as a learner reaches the later stages of their learning journey by progressing into the Senior Phase and undertaking either National, Higher, Advanced Higher or Baccalaureate qualifications. There is a need for all learning to be based on strong subject disciplines. However, with the exception of

Baccalaureates, opportunities for real-life Inter-Disciplinary Learning appear to be scarce.

Learners are given the opportunity to engage in a piece of research, application or to deepen their knowledge in an area through Added Value Units which aim to put the learner at the centre of their own learning experience. However the requirement to undertake this task in each of the subjects chosen (variable across Scotland from five subjects to eight depending on local authority and school) leads to a potential for over assessment, unnecessary duplication of application and ineffective use of teacher time supporting similar experiences in several areas. This was seen as a missed opportunity for learning across the curriculum.

The course, unit and assessment specifications for each of the new National Qualifications provide statements with regards to skills for learning, life and work as well as opportunities to develop core literacy and numeracy skills. However, the working group feel that an urgent review of the Added Value Units should take place and that consideration should be given to students undertaking no more than four Value Added Units in any one year. Furthermore that these are spread between Literacy (and related curriculum areas to include Social Studies, and RMPS), Numeracy, Health and Wellbeing and STEAM (to include Science, Technologies, [Engineering: not a CfE Curriculum area] Arts and Mathematics [under the broad curriculum heading of numeracy]).



Recommendations

- 1) Teachers should** have access to resources which signpost them to an executive summary of research relating to the origin, purposes and impact of Inter-Disciplinary Learning both in this country and internationally. Practitioners must be clear on what their ultimate purposes is before embarking on Inter-Disciplinary Learning. To help practitioners reflect on that purpose a resource should be made available which highlights the aims, objectives and potential outcomes from successful Inter-Disciplinary Learning projects.
- 2) With planning** being so crucial to Inter-Disciplinary Learning it is recommended that a resource be made available for practitioners which clearly highlights the aims of Inter-Disciplinary Learning and which gives examples of planning tools and approaches that have led to successful cases of Inter-Disciplinary Learning taking place.
- 3) It is recommended that** each school has a document and/or visual representation of the totality of the curriculum that is planned in that establishment and furthermore examples of where Inter-Disciplinary Learning takes place. Many schools already have a curriculum map which might be altered to ensure Inter-Disciplinary Learning is adequately planned and catered for.
- 4) It is recommended that** funds be made available for a research study into the scope, scale and impact of current Inter-Disciplinary Learning in both the primary school and secondary schools in Scotland at the present time. This study should reflect on the value added to student attainment and achievement by taking an inter-disciplinary approach as opposed to a discipline orientated approach to learning.
- 5) It is recommended that** opportunities for collaboration between primary, secondary, college and university practitioners are made available across curriculum areas. The Young Academy of Scotland along with the Royal Society of Edinburgh could collaborate to provide opportunities for inter-disciplinary 'incubators' which can be initiated, developed, supported, evaluated and exhibited. These might be set up in a similar funding model and approach as the Crucible. An early model of this sort of collaboration has already been piloted with the "History: A Model for Collaboration" event held at the Royal Society of Edinburgh in February 2013 which was supported by numerous Young Academy of Scotland members.⁶
- 6) It is recommended that** local authorities and schools give consideration to the employment of transition teachers for the 'responsibility of all areas' of literacy, numeracy and health and wellbeing. These teachers would be specialist in their degree background for these areas and would be responsible for teaching learners these core skills in P6/P7 and S1/S2 to aid the transition and promote the development of those core skills independent of the application of them as part of their wider curricular studies. Transition teachers should be deployed in both primary and secondary schools or work between those schools to enhance transitions in broad and core curriculum areas.
- 7) The groups recommends** a review of secondary timetabling and consideration be given to fewer and longer learning episodes in the secondary school timetable to facilitate more activity-based research based, student driven, deeper learning opportunities. Counter-arguments to this approach raised questions relating to adequate resources (including high specification IT equipment for learners), appropriate positive behaviour management strategies, an associated positive ethos and positive staff student relations. Consideration would need to be given to those factors. It was also felt that longer periods would allow for the potential of more outdoor learning to take place and for travel to and from learning environments outwith the school to happen more readily.⁷
- 8) The Scottish Government and local authorities** should consider funding transport for school students during the school day to facilitate learning beyond the school campus. Consideration should be given to extending travel grant schemes such as that in existence for education related travel to History and Heritage sites. Such an extension would allow for students to engage in real learning in contexts where experiences and outcomes can be applied in the world of learning, life and work beyond the school campus.



The RSE Young Academy of Scotland fosters interdisciplinary activities among emerging leaders from the disciplines of science and humanities, the professions, the arts, sport, business and civil society.

Established by the Royal Society of Edinburgh in 2011, the Young Academy of Scotland provides a platform for able and innovative young entrepreneurs, professionals and academics to develop a coherent and influential voice, and to address the most challenging issues facing society in Scotland and beyond.

Notes

¹The SQA website defines Added Value as “Added value is what makes the Course more than the sum of its parts. Added value assessment combines different elements of a Course into overall assessment which learners are required to pass in order to achieve a Course at National 4 to Advanced Higher. For instance, learners studying National 4 Practical Woodworking will work on three distinct Units - Flat Frame Construction, Carcase Construction and Machining and Finishing - during their studies. The learners will also be required to pass an additional Added Value Unit - Making a Finished Product from Wood - which requires them to produce a finished product which provides evidence of some of the skills, knowledge, understanding they have acquired throughout their Course. In another example, learners studying National 5 Geography will also work on three Units – Global Issues, Human Environments and Physical Environments. These learners will have the opportunity to apply the knowledge and skills they have learned while studying these three Units in their Course assessment. Added value in Courses will be assessed using seven broad methods: Assignments, case studies, practical activities, performances, portfolios, projects, and question papers/tests.” More detail can be found at:- <http://www.sqa.org.uk/sqa/63010.html>

² More details can be found at www.youngacademyofscotland.org.uk

³ <http://www.scotland.gov.uk/Publications/2008/06/06104407/5> and <http://www.education.scotland.gov.uk/thecurriculum/howisthecurriculumorganised/inter-disciplinarylearning/>

⁴ <http://www.scotland.gov.uk/Publications/2008/06/06104407/5>

⁵ More details on this model can be found at <http://www1.hw.ac.uk/scottishcrucible/>

⁶ A full report of this event can be found at http://www.royalsoced.org.uk/cms/files/events/reports/2012-2013/Teaching_of_History.pdf

⁷ See Recommendation 8

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