

ASTI SUBMISSION

**STEM EDUCATION IMPLEMENTATION
PLAN 2022 – 2026**

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Introduction

The development of the next phase of the STEM Education Implementation Plan has assumed a heightened significance in light of the COVID-19 pandemic. In particular, the centrality of science in responding to the unprecedented health challenge, the economic dislocation, disruption to global production and supply chains, and the role of science in informing decision-making has impacted deeply on the public consciousness. The pandemic has also graphically clarified that science and technology are not neutral practices but, rather, can be deployed to serve private and corporate ambitions with little regard to public wellbeing, democratic political cultures or, indeed, the very concept of scientific fact itself.

The ASTI had previously engaged in the consultation process for the development of STEM education policy. In this submission, the ASTI will provide some overall observations on education policy implementation and on specific actions under the four pillars identified in the consultation process.

Implementing education policy

Much has been learned in recent years on implementing education policy. The experience of implementing the Framework for Junior Cycle has served to underscore the necessity for policy makers to strengthen stakeholder engagement and ensure a conducive context for change. Indeed, these were key points in the subsequent OECD study of the senior cycle review process. Wider stakeholder engagement should not diminish the voice of teachers in the change process. When that voice is diminished, teachers feel alienated and demoralised. As the professionals who are charged with delivering on national policy goals and objectives, their unique experiences and expertise must hold weight in the policy process.

Creating conducive conditions for change is also critical. Investment in schools and in the teaching profession is the key. Investment in schools means that schools have adequate accommodation, specialist workshops/laboratories, uncrowded classrooms and resources for each subject area. Investment in the teaching profession requires that the student: teacher ratios are proportionate; those teachers have sufficient non-class-contact time to discharge their duties; that teachers' workload is sustainable (hugely dependant on class size); and that they have access to relevant CPD during their working time.

Year on year, the OECD Education at a Glance report provides detailed evidence that Ireland is not keeping pace with competitor economies. In fact, it has been at the bottom of 27 EU and 36 OECD states for investment for a number of years in a row. The alarm bells on this appalling investment record were trenchantly sounded by IBEC in response to the 2021 OECD Report: *"Investment in education and skills is the cornerstone of a strong and dynamic economy and society. Talented people, the availability of key skills, and the ability to connect with education through lifelong learning and research activity are a positive feature of Ireland's competitive offering."*¹

Annual research commissioned by the ASTI with Red C Marketing provides unequivocal evidence that schools are really feeling the impact of under-investment. In the 2020 survey, the majority of teachers stated that large classes have a negative impact on teaching and learning and on the disciplinary

¹ <https://www.ibec.ie/connect-and-learn/media/2021/09/17/ireland-cannot-become-complacent-with-investment-in-education>

climate. At least 4 in 5 teachers stated that class size inhibits the range of teaching strategies used and opportunities for students to engage in group and other collaborative work.²

Under-investment is having a significant negative impact on the profession. Between 2009 and 2020, teachers' level of job satisfaction dropped from 77% to 48%. The main source of job dissatisfaction was workload. Other factors also impact such as little space in education policy for teacher wellbeing; unequal pay for post-2010 entrants; constant innovation and change in education; and not having enough human resources in schools to meet needs. (This latter factor includes not having enough professional time and insufficient professional supports for students) Combined, these factors make teachers resistant in the face of change as they do not have confidence that adequate resources will be provided.

The above statements must be of concern to policy makers irrespective of the particular policy area. It is incontestable the STEM education policy is really important for the economy, for an informed citizenry, for climate change. However, implementing this policy requires sustained investment and collaboration with the teaching profession.

Nurture learner engagement and participation

Learner engagement is at the heart of learning. Cultivating and reinforcing this engagement is at the core of teaching. It is simultaneously a task for the individual teacher and the wider school community. This applies across all subject and programme areas. One of strengths of Irish second level schools is the commitment by teachers and schools to **curriculum enrichment programmes** such as Young Scientist Exhibition, Young Social Innovators, School Green Flag, CIF School Challenge, Take Action for Climate Change, EcoUNESCO, etc. However, teachers' commitment to these activities cannot be taken for granted. ASTI research has frequently found evidence that workload and other duties such as supervision and substitution is eroding any spare time that teachers have. This is a serious development but one, it would seem, that is ignored by the employer.

Quality **guidance counselling service** in schools is fundamental to supporting learner engagement and in making subject choices. The Framework for Junior Cycle locates this service as one of the pillars of the wellbeing programme. However, the restoration of guidance posts in schools post-2009 austerity cuts has not kept pace with demand or demographic growth. As noted in its 2019 Review of the Career Guidance, research among guidance counsellors suggests that initial consideration of career choices usually occurs during the Junior Cycle.³ The importance of the availability of adequately staff Guidance Counselling service in schools cannot be overstated. It is of particular significance for subjects which are highly gendered or perceived as difficult, or both. STEM subjects fall within these categories.

Resources for teaching science require a national audit. Some schools have state-of-the art laboratories while do not others. This disparity between schools is unacceptable and impacts on teaching and learning. Moreover, many schools are over-crowded and do not have enough laboratories. Numbers of students taking STEM subjects are frequently constrained by space and many students have to make subject choices at an unacceptable early stage of their education. Another major problem, and one that is really negatively impacting on all science teachers, is the non-availability of laboratory technicians. This deficiency is causing huge additional work for teachers, limits the range of experiments for students, and causes concerns around health and safety in the classroom.

² <https://www.asti.ie/document-library/class-size-and-the-physical-environment-in-our-schools-the/>

³ <https://assets.gov.ie/24951/dffde726604b451aa6cc50239a375299.pdf>

Increased partnerships between schools, businesses, public sector bodies, etc., is critically important. Such partnerships are already well established in terms of curriculum enrichment activities and are highly valued as constituting learning opportunities for all. However, from the teachers' perspective they take time – and that is the one resource which teachers are in dire shortage of. STEM subjects should have dedicated co-ordinators such as those provided for senior cycle programmes to engage in the outreach, research and planning essential to effective partnerships.

The number of leadership posts in schools must be increased to **strengthen the leadership capacity** for leading in teaching and learning. It is worth reiterating the role under this domain of leadership: promote a culture of improvement, collaboration, innovation and creativity in learning, teaching and assessment; foster a commitment to inclusion, equality of opportunity and the holistic development of each student; manage the planning and implementation of the school curriculum; foster teacher professional development that enriches teachers' and students' learning.⁴

Enhance teacher capacity

Education is, at its core, based on relationships. Learning is primarily a social practice as has been dramatically demonstrated by school closures. Teachers are agents of change for young people: when they teach, they motivate, support, assist and socialise young people. Teacher professionalism in Ireland is internationally acknowledged and is the driving force for the quality education that is our hallmark. At the same time, the state does not provide sufficient supports to the profession to support their continuously evolving role. Teachers have heavy workloads and work in institutions which are experiencing 'innovation overload'. **Professional supports** such as access to CPD, professional time for non-teaching work, career progression and mobility are significantly under-developed in comparison to other EU and OECD systems.

High quality teaching is essential for quality education. Teachers must deploy multiple pedagogical approaches to enable students to develop mastery of challenging content, to problem-solve, communicate and collaborate on their learning, to remain motivated and develop agency. In turn, effective professional development is needed to help teachers develop their pedagogical skills and their content knowledge. The dominant model of teacher professional development in Ireland is the 'transmission model' wherein information is provided to teachers in once-off or short sessions on new curriculum. Increasingly, the Department of Education is providing this model outside of teachers' working time. This is unacceptable and is undermining teachers' wellbeing.

The literature on teacher learning has identified seven widely shared features of effective teacher learning.⁵ Such professional development:

1. Is content focused
2. Incorporates adult learning theory
3. Supports collaboration, typically in job-embedded contexts

⁴ <https://circulars.gov.ie/pdf/circular/education/2018/03.pdf>

⁵ https://learningpolicyinstitute.org/sites/default/files/product-files/Effective_Teacher_Professional_Development_B

4. Models effective practice
5. Provides coaching and expert support
6. Offers opportunities for feedback and reflection
7. Is of sustained duration

These seven features are central to the concept of schools as professional learning communities. This vision will never be realised if issues of workload, professional time, access to mentoring/coaching, and wellbeing are not addressed.

Enhancing teacher capacity cannot be reduced to a focus on teachers' professional learning. It must also comprehend wider ambitions for the profession. It is a matter of extreme concern to the ASTI that the **attractiveness of teaching as a profession** is dramatically diminishing. Several factors are key in determining attractiveness, including salary. While teachers want to teach because they want to work with and help young people, they also know that their work is important and should be appropriately remunerated. It is expensive to train as a teacher: it is totally demoralising to do the same work for a lower salary scale *and* inferior pension entitlements. **Unequal pay structures** are having a corrosive impact on the profession. The public perception of the profession is also an important dimension of its attractiveness. Negative media commentary and ill-founded expectations of the work of teachers and schools' damages morale. Workload is also critical. Indeed, after unequal pay, workload is cited in ASTI surveys as a major cause of work dissatisfaction. Intensification of work, innovation overload and teacher wellbeing are the dominant themes in teacher discourse today.

Long-standing problems in **teacher supply** underline the diminishing attractiveness of teaching as a profession. Prior to March 2020 it he most pressing issue in education policy. This problem was, and remains, particularly acute in STEM subjects. The high cost of initial teacher training is having a negative impact on supply. Currently, the 2-year Post-graduate Masters in Education/PME costs between €11,000 and €14,000. Student teachers complete a 20-week practice placement (10-weeks block-release) which attendant accommodation and commuting costs. Academic research has identified the high costs of initial teacher education as one of the reasons for a lack of diversity in the teaching profession.

Support STEM education practice

The professional learning, skills and expertise that has been acquired by teachers and students during the shutdown of schools has been phenomenal. This is particularly the case in relation to using digital technologies to teach and to learn. However, it is deeper than the acquisition of digital skills: teachers have also engaged in reflection on their teaching, on effective methodologies, on diversity in students' learning. Smart policy should build on this learning by making sure that effective professional learning models are developed not just for STEM subjects but across the curriculum. At the same time, the ASTI also point out that there were downsides to remote teaching in terms of teachers having to create digital learning content, teach students without suitable digital devices or poor broadband, being 'always on' and, for most, an exponential increase in workload. These negative experiences can be addressed by good education policy. In this regard, it is fortuitous that the **National Digital Learning Strategy** is also currently under preparation. The Department of Education must ensure a high degree of coherence between both policies as the use and application of digital technologies is particularly germane to STEM subjects. Underpinning both must be an explicit focus on the social context of all science and technology, and the concomitant requirement for enabling students to recognise, understand and engage with the deeply complex ethical issues attendant on science and technology. The key skills embedded in the junior cycle subject specifications provide a template in this regard.

Use evidence to support STEM education

The ASTI supports the principle of evidence-based change in education. The perception by teachers that the change agenda is often set elsewhere leads to mistrust and disengagement. While we can and should learn from other systems, we also need to value and trust what is good in our own education system. The Irish education system has benefited from engaging with the international evidence and best practice through, for example, the EU 2020 policy cooperation framework and will doubtless continue to do so within the successor programme, the European Education Area 2025.⁶ Policy guidance and technical expertise from multi-lateral organisations such as the OECD and UNESCO is also significant. Policy learning should not be confused with policy borrowing. In this regard, the ASTI must put on record its rejection of the model of school accountability in the Education (Parents and Students' Charter) Bill, 2018. It is premised on a market model of service provider-and-client. It totally fails to reflect the community or social dimension of education. It is, moreover, contrary to the Inspectorate's model of accountability and evaluation which is based on school improvement based on school self-evaluation and teacher professionalism.

Conclusion

Phase 3 of the STEM Education Policy Statement is focused on implementation. This phase of education policy is the most critical, the most challenging and depends, above all, on the professionalism of teachers. The latter is not simply a matter of quality and standards in teacher education. Far too little attention is given in Irish education policy to that other dimension of teacher professionalism, namely, teachers' working conditions. As has been reiterated above, these are increasingly experienced as negative by teachers and, cumulatively, undermine the attractiveness of teachers as a profession. Workload, work intensification, lack of professional time, unequal pay, poorly resourced and overcrowded schools and, increasingly, the key issue for many teachers, a complete lack of attention in education policy to teachers' wellbeing, are impacting on teachers' response to curriculum change, demands for innovation and upskilling. The role of the ASTI as a teachers union is to communicate these concerns, to advocate that they be addressed and to engage with the policy makers to this end.

⁶ https://ec.europa.eu/education/education-in-the-eu/european-education-area_en