Interim Evaluation of the Pilot Year of the Northern Ireland Engineering Education Programme (NIEEP)

FINAL Report

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# Executive Summary

The Northern Ireland Engineering Education Programme (NIEEP) was launched as a pilot in spring 2022. It was driven by the recognised shortage of STEM skills in Northern Ireland and a desire to encourage more young people in the region, particularly young women and those from socially disadvantaged backgrounds and other under-represented groups, to progress towards careers in professional engineering roles or as engineering technicians.

There are three core elements to the Programme:

 1) *to support a network of schools and colleges across Northern Ireland, which have been identified working closely with the NI Department for the Economy, through an in-house grant of up to £3000*

*2)* *A £15,000 bursary targeted at NI-resident women students from low-income households, and those who are under-represented in the engineering sector in their first year of a university in an engineering related degree*

3) *A £2,000 bursary to support young women studying engineering or engineering-related subjects at A-level, and vocational engineering qualifications*

The Programme is delivered by the Royal Academy for Engineering (RAEng). It costs £500,000 and is fully funded by the Department for the Economy (DfE). It was originally funded for the period 1 March 2022 to 31 July 2023, but an extension was agreed with DfE to 31 December 2023 to allow more time to reach the (amended) targets, due to challenges around school recruitment.

From a strategic perspective, the NIEEP supported several DfE strategies and policies including its Economic Recovery Action Plan (ERAP), 10X Vision, Draft Women in STEM Action Plan and the draft Gender Equality Strategy as well as the wider strategies and workstreams within and across Government Departments including Education.

An evaluation of the pilot year of the Northern Ireland Engineering Education Programme was commissioned to understand the impact of the engineering education activities offered within the primary, post-primary schools and further education colleges engaged in the programme, as well as the administration of the post-16 Bursary by the in-house coordinators and higher education Bursary provided through the programme. In terms of the three core elements, progress and observations to date include:

***The In-House Grant***

The NIEEP has set out to create ‘clusters’ of schools/colleges to support the development of a platform to share resources and encourage students into STEM and particularly engineering through their school/college journey. By linking networks of schools/colleges to locally based STEM employers, universities and other stakeholders, this will raise students’ skills levels and provide links to real-world engineering, supporting and enhancing knowledge of engineering careers and the pathways available to them. The grant of up to £3,000 supports the purchase of kit and resources and to celebrate national events, there is a peer-to-peer support network for STEM teachers, which also provides teacher CPD and training on Academy educational resources which introduce students to real-world engineering.

The aim was to include fifty-two schools/colleges across four clusters involving sixteen employers. To date, twelve schools have fully participated in the Programme with twenty further schools at varying stages in the grant application process. Of the thirty-two that are participating, two are FE colleges, sixteen are post-primary schools and fifteen are primary schools. No one cluster has been fully established yet. At this point, ten employers are involved to varying degrees.

There have been several issues that have delayed the engagement of schools, both internal and external to the programme delivery. This has included the delayed appointment of the NIEEP Programme Manager following an unsuccessful first round of recruitment and setting up procedures and processes to engage with schools/colleges including the MOU. There have been several factors around school recruitment including school readjustment after COVID, industrial action taking place, restrictive budgets and teachers who are very stretched in their ‘day job’ and finding it challenging to take on new projects. These issues have been worked through although remain challenging which is in part reflected in the request to reduce the number of schools/colleges involved from fifty-two to forty-two.

A review of the 2022/23 End of Year reports by teachers highlights that grant support amounted to £38,075 at that point. There has been little additional funding from schools with one notable exception which matched the NIEEP grant. Of the fifteen schools that completed the End of Year reports, 10 provided fully complete information on the extent of student and teacher engagement on the Programme in their end of year reports. The remaining five schools did not deliver projects in AY22/23 and submitted End of Year reports to reflect engagement with the programme more widely. These reports highlight that at the point of reporting, the Programme has engaged with around 2,300 student learning opportunities (the number of students engaged in each activity) for the 10 schools with full information (this is closer to 2,500 including partial information from others). This is split 52% boys and 48% girls. The average number of student learning experiences per school/college is 230. This would mean that if forty-two schools were involved eventually in the Programme, this could amount to almost 10,000 learning opportunities if the level of engagement to date is used to forecast future performance. However, it would be important to understand and monitor these numbers over time to understand uptake and progress.

For those teachers/schools involved to date, there is a strong sense of additionality with the Programme in supporting and developing the curriculum around STEM and engineering. It allows them to purchase materials that the schools would otherwise not have afforded to purchase. The Programme is highly rated with significant enthusiasm around its benefits including the Programme’s practical hands-on experience for students in the applications of Engineering/STEM, supporting the teachers to ‘teach’ the curriculum, highlighting career opportunities in Engineering/STEM and addressing inequalities in students’ exposure to and understanding of engineering as a career. Teachers also noted considerable transferable skills benefits for students including problem solving, communication and working as a team.

The Programme is also notable in supporting teachers to teach and improving their confidence in STEM which was noted by the Women in STEM Steering Group as a challenge. A number have received training in the resource boxes and further training sessions are planned.

The inclusion of business/industry is a strong part of the cluster approach to the Programme, addressing challenges in providing exposure and opportunity to students in schools that find it more difficult to attract interest from the sector. While still at early stages, there has been some positive feedback from schools about the interest and potential impact of this link including job opportunities for students after their studies.

Several observations and recommendations at this interim stage in the Programme are made as follows:

* *Engagement with Schools*

The evaluation has highlighted that there is an issue of initiating and maintaining engagement with schools. It has been challenging to raise awareness to recruit schools and this also links to the ongoing process to keep schools involved. For example, one post-primary college has recently had to withdraw and another is not active. One that was not as engaged is now fully involved. Ongoing issues include changing teacher roles, stretched staff/resources and there has been disruption around industrial action which the Programme Manager has had to work around.

Schools have been introduced at different stages and this has made regular meetings with the ‘cluster’ more difficult. However, as the Programme and school engagement becomes more settled this is now planned as a regular feature of the Programme.

* *Engagement with teachers*

A core element of the Programme is to boost the confidence and expand the knowledge of teachers. There is room for further expansion of this aspect of the Programme for CPD and continual learning and engagement. It would be helpful to have greater collaboration between teachers generally such as a forum for sharing ideas and learning.

* Engagement with Business/Industry

The role of business/industry in the Programme is key and at this point in the pilot programme there should be more emphasis placed on their involvement with schools/colleges going forward. There should be a set of metrics to measure the extent of school involvement and to understand how they have influenced the students in their studies towards an engineering/STEM career.

* *Equitable Access*

A specific issue has been raised around access by some schools/students to aspects of the Programme that involve travel. Grant monies cannot be used for transport outside of the project scope. Transport costs should be included in their grant application and captured at this stage. There is not a supplementary fund within the programme that can be used for transport to events/activities outside of this being factored into grant submissions which limits certain children’s ability to participate. An example is attending the celebration event in Stranmillis in March where some schools wanted transport costs covered while other schools were able to absorb the costs within their school budget. One school had their own school bus, which helps, other schools got taxis, hired coaches and did not query costs/expenses for this. Given the ethos of the Programme around widening and equitable access, it would be useful to discuss exactly how transport costs can be covered in the Programme and communicate this to all schools/colleges involved.

* *Engagement with Careers Advisors*

Given the importance of profiling engineering as a career and the challenges for teachers of providing all aspects of support, the potential to engage with Career’s Advisors, internal and external to the schools/colleges, could be explored as a complimentary element to the NIEEP Programme.

* *The Cluster Model*

The original idea was that there would be four clusters of schools/colleges built around several primary, post-primary schools and colleges. It has taken time to establish how best to take this forward and it has proven more challenging than anticipated at the outset. Challenges around school/college recruitment noted above has made it difficult to build the Cluster Model and the recommendation to reduce the number of schools/colleges involved from fifty-two to forty-two reflects this. It would be important to get at least one cluster developed as soon as possible to test out the different elements to the approach, particularly around employer engagement and peer-to-peer support.

Without this, it is difficult to take forward the networks and shared resource platforms that are at the core of the sustainable model approach.

* *The Application Process*

The application process has developed as the recruitment of schools has become established and bedded into the Programme. It would remain important to monitor all aspects of this process on an ongoing basis to consider timeliness of the application process from application through to acceptance and the timeliness of grant payments.

* *The End of Year Report*

A more detailed discussion is outlined below around the way in which the Programme is monitored and impact measured to date. The end of year reports are a key part of that process but currently are very qualitative in nature and can tend to be repetitive. In addition, there is no opportunity to highlight the challenges with the Programme to understand how to address them (although the Programme Manager does have ongoing contact with schools/colleges). Considering recommendations below on impact measurement, the end of year report format should be reviewed in content, format and how data is captured to support a more focused approach on activities, impact and challenges. This should be more helpful to schools/colleges in providing clarity around what should be captured and fed back on their Programme experience.

* *The Peer-To-Peer Support Network*

There is a strong emphasis in the Programme approach in supporting Peer-To-Peer networking and learning practices among teachers. Delays in the Programme have meant that this is not as well developed as was hoped. It is important that this is brought to the fore going forward and might benefit from a structured approach to how teachers engage with each other. Teacher CPD has taken place in the training provided through the Box resource (e.g., Future of Flight in February) and it would be important to record this as a programme output/impact.

* *The Role of Universities*

Links to universities are mentioned as part of Programme engagement and it would be useful to report on the extent and nature of that engagement as part of the Programme reporting process. This already includes school visits with STEM learning opportunities and developing the networks that the Academy has already established. There are plans for increased engagement as the Programme develops and this should be captured as these relationships are built.

***Higher Education Bursary***

The Higher Education bursary, worth £15,000 per student over three years, was established to support women from low-income households studying engineering at degree level. It set out with a very strict criteria focus on two ways of determining low income – Free School Meals (FSM) and having a parent or guardian who receives means-tested benefits. The timing of the bursary was delayed due to delays in signing the grant agreement meaning that the bursary could not be launched or advertised. This meant that by the time it was launched, most potential applicants were already on study leave/were taking their A Levels. When it was advertised only three applications were received, all of whom secured it. Issues raised included the timing of its launch, towards the end of the school year and visibility in terms of communications around the fact it was available. When the bursary was relaunched for a second time later in 2022, the project team agreed to revise the criteria to bring it into line with other Academy schemes. As the potential applicants were, by now, already enrolled at university, it made sense to change the eligibility criteria from a parent or guardian who receives means tested benefits to a potential applicant being in receipt of any kind of funding – scholarship, bursary or grant, either from their university or the government, that was awarded based on their personal or household financial situation[[1]](#footnote-2). Following the relaunch, four further applicants came forward, all of whom were awarded, three of these secured the grant assessed on criteria including their application, interview and eligibility checks. One place was not filled and the £15,000 was reallocated within the Programme.

The grant has been positively received by students who found the application process straightforward and clear. They have used the support for various purposes from buying laptops and books to supporting them to cut back on paid part-time work to concentrate on their studies.

* *The lower-than-expected uptake in the HE Bursary*

The take up of the Bursary was relatively low to the extent that there were two calls for applications, a change to the eligibility criteria given that students were already enrolled at university during the second call, and in the end one Bursary could not be awarded. This could be for a number of reasons – lack of demand due to the criteria which says something about the extent of uptake of STEM/Engineering as a degree among more disadvantaged students, and/or lack of awareness of the bursary’s existence which includes timing in that students had left school and therefore less engaged in the school process. It is interesting to note that one of the Bursary recipients had several friends going on to study a STEM subject at HE but were unaware of the Bursary award. The Programme Manager did approach the Education Authority and others to make sure they were targeting the right pool of people. Discussions with the Programme Manager of the RAEng’s Lord Bhattacharyya Engineering Education Programme (LBEEP) in the West Midlands highlighted their experience of the time taken to build up awareness among teachers, students and other stakeholders to grow applicant numbers but once established their numbers have grown both generally and in those who have received the Post 16 Bursary then applying for the HE Bursary. For example, the first Cohort for the LBEEP HE Bursary application process secured just seven applicants but rose to nineteen by the fourth cohort. For the Post 16 Bursary, Cohort 1 secured twenty eligible applicants rising to forty-six by Cohort 3.

* *The application of the HE bursary criteria*

A review of the documentation around the bursary awardees suggests that the evidential follow up to demonstrate that applicants meet the criteria is not always provided, particularly among the second group of awardees. That they have met one or more of the criteria is typically taken on trust across wider RAEng programmes, particularly as applicants sign their application on that basis. Given the small numbers involved but large bursary size it would be useful to explore whether more evidence should be provided as part of the application process.

The change in criteria has brought the NIEEP into line with other RAEng Programmes targeted at students already enrolled in higher education. This reflects the fact that students are, by then, classed as ‘adults’ and assessing economic status through parents may not be appropriate. This is why the new criteria around receipt of government/University support, awarded based on personal/household financial situation, has been included. This is an important addition to the criteria, and it would be useful to understand this addition in how it applies to eligible HE bursary candidates.

* *Bursary Impact*

It is hard to demonstrate the impact of the bursary, except for the fact that the recipients are recorded as having met a set of criteria that means they may have financial challenges and this award supports them to stay in their chosen degree course. This meets the objectives of the bursary award. The Programme Manager does keep in contact with recipients and this includes engaging with them in their involvement as ‘role models’ for future STEM undergraduates. For example, one HE bursary recipient attended the celebration event in March and gave a speech to the students about the impact the bursary was having on her and how she was finding her first year at university. Another HE bursary awardee attended the Academy’s Annual Awards dinner in London representing the programme. A Post 16 bursary awardee gave a speech at the celebration event. It is written in the HE bursary terms that they must be prepared to act as an ambassador for the NIEEP.

In the medium to longer term, it will be important to maintain ongoing engagement with the recipients to support an understanding of the future direction of their careers.

* *The value of the Bursary*

The origins of the £15,000 bursary amount are connected to an aspiration that students can be substantively supported to stay in their studies and the interviews suggest that this amount has provided security and support. Other Academy Higher Education programmes which influenced the NIEEP award also provide this amount:

* + - Engineering Leaders Scholarship - £5-10K to enhance personal development with suggestions on trips abroad, conferences, training, internships, language learning.
		- Amazon Future Engineer Bursary - £5k per year for up to four years of study to cover expenses related to attending university, including tuition fees, accommodation or living costs.

This is a substantive award. For example, a short review of Engineering Bursary suggests on average award of £1,000 per annum[[2]](#footnote-3) although a number are higher. This makes it even more important that recipients meet the criteria focusing on those who would typically find sustaining their university place challenging and that they sign up to giving something back to the Programme in terms of driving awareness of engineering to other students.

***Post 16 Bursary***

The Post 16 bursary is at an early stage given that it was launched a few months later than anticipated. 30 bursaries have been allowed for. To date, eighteen have been awarded with two half bursaries. The process appears to have worked well, involving the school/college coordinators in the recruitment and application/decision making process. This direct engagement is a strength in supporting the NIEEP coordinator to ensure the bursary are awarded to those that meet the criteria.

At this point, observations and recommendations focus on the bursary criteria and how that is met and monitored to inform the impacts set out for both the wider Programme and Post 16 bursary particularly. This includes:

* It would be important to fully understand the background of students accessing the bursary including how they meet the criteria in terms of FSMs/Parental Benefits. This will help build an important profile of bursary recipients.
* It would also be useful to review how students plan to spend the grant in their application form.
* Are the in-school coordinators recording and communicating to the Programme Manager that the bursary recipients have the necessary attendance and have passed their first year of study?
* What Ambassador role is planned for bursary students in encouraging next year’s intake?

Ultimately, the bursary is to support students to follow through to further education and/or a career in engineering and it would be important to follow up with those students at the end of their course studies to understand what is next for them. This is formally written into the bursary Agreement with students.

Further key findings and recommendations from the evaluation include the following:

There appears to have been good communication between the NIEEP Programme Manager and the Department for the Economy, exploring and testing approaches, developing contacts, developing materials and making key decisions when required on core elements of the Programme such as the bursary. In terms of reporting this has involved regular Milestone Reports which have been submitted every quarter. There is also regular Budget Management reporting. Regular meetings and minutes take place every three weeks (was every two weeks up to May 2023).

There has also been strong engagement within RAEng who have provided support in terms of oversight, administration, planning and event organisation, grant/bursary application review and marketing and communications.

There is an identified and clear need for the Programme in filling a very significant gap in the number and quality of materials available to schools and students and its role in supporting schools to promote the importance of Engineering and STEM generally but particularly among women and among more disadvantaged students who are underrepresented in both. It was clear that teachers find these additional resources hugely helpful, particularly in taking a more practical approach to the subject which is particularly helpful with student engagement. The resources were not likely to be bought through school funds, which highlights not only their value added but also how limited existing resources and the focus on engineering/STEM in many schools is. One comment was that this was being treated as a ‘luxury’ when in fact it should be thought of as a ‘necessity’.

The ‘Cluster’ approach aims to build skills and connections among both teachers and students and involve the business community at an early stage in the student’s exposure to how engineering/STEM can lead to a very fulfilling career. No clusters have been fully established yet but the concept when fully operational makes sense in terms of sharing of resources, best practice, networking, and teacher skills development. The role of business is particularly important in demonstrating career pathways.

There have been specific issues with each element of the Programme which have been set out above. Other issues to consider in the Programme more widely include:

* *Communications*

The Communications piece is integral to all aspect of this Programme – engaging with teachers, engaging with students, involving business/industry and communication around the various events connected to the Programme. This involved the Programme Manager, RAEng, DfE and other key stakeholders. A dedicated Communications Plan identifying roles and resources would be useful to get a sense of the achievability of ambitions of the Programme.

* *Wider Involvement*

It is important to note that the NIEEP is a small pilot programme, testing out methods to develop understanding and interest in a very critical part of the future world of work. It cannot be viewed in isolation and therefore an appreciation of its role within the wider policy landscape would be important. There are existing relationships with the DfE, Matrix, WiSTEM and these should be built on as the Programme becomes more embedded in the STEM policy framework.

There is the opportunity for wider involvement of other Departments and Stakeholders in the Programme. For example, at present the Programme does not include any direct involvement with the Department for Education. The Department did provide support in pinpointing schools to target for Free School Meals but there is no direct involvement in the delivery, oversight, and funding of the Programme. It would be useful to establish at this point in the Programme:

 1) where the STEM agenda is within the Education system e.g., STEM Advisors, and

2) engagement with the Department on any potential role in supporting/expanding the Programme’s reach.

* *Measuring Impact*

Part of the evidence base in developing the Programme was the impact of existing regional programmes in places such as Barrow in Furness, the Welsh Valleys, and the West Midlands. They suggest impacts including higher rates of attainment and uptake in STEM subjects, improved perceptions of engineering careers, improved knowledge of pathways to engineering/STEM careers amongst teachers and pupils and enhanced employer advocacy. In addition, demand for college-level engineering courses within these regional programmes had increased; one college had launched two new engineering qualifications to meet demand, and another had seen their engineering cohort triple in size on one of their courses. This highlights the potential for the Programme in Northern Ireland.

The pilot phase of the Programme has focused to date largely on establishing relationships, establishing processes, governance and reporting, recruiting schools, getting the bursary elements of the Programme established. This has involved a significant amount of investment in time and resources. At this point it would be important to consider how to measure the outcomes and impact of the Programme in terms of meeting its objectives. The Business Case notes that a SMART methodology (Specific, Measurable, Achievable, Realistic and Time-Dependent) should be adopted by the Programme with targets related to these objectives, along with the current Baselinemeasure. This should involve the development of a specific set of metrics, potentially both hard and soft, that demonstrate change. This could include changing attitudes/perceptions of engineering as a career, career aspirations, career choices, increased demand within the educational systems for engineering/STEM as subject choices. From a teacher perspective, it could include improved confidence levels among teachers. Feedback to date has been largely qualitative (which does have a role as recognised in the Business Case), but it would be useful to include a metric/set of metrics that demonstrate that the schools/teachers/students have started out in their understanding and aspirations around engineering as a career and where they end up through the support of the Programme. The RAEng has already developed an Evaluation Tool for other Programmes which could provide the template. They also use the EngineeringUK Brand Monitor which could also provide a baseline and comparator for the NIEEP progress and impact.

In addition, using a platform such as SurveyMonkey means that the participant data can be held in a much more accessible and usable format.

* *Separation of Delivery from Programme Impact Monitoring*

It might be useful to consider separation of the responsibilities for Programme delivery with ongoing monitoring. This means that once a well-defined and communicated monitoring and impact process is established, a small amount of time/resource could focus on ensuring that the relevant data is captured to support the ongoing assessment of Programme outputs and impacts. This would ensure that the Programme Manager’s time is dedicated to driving the Programme agenda and fostering positive relationships with the key stakeholders in the Programme.

# Introduction and Terms of Reference

## Introduction

The Northern Ireland Engineering Education Programme (NIEEP) was launched as a pilot in spring 2022. It was driven by the recognised shortage of STEM skills in Northern Ireland and a desire to encourage more young people in the region, particularly young women and those from socially disadvantaged backgrounds and other under-represented groups, to progress towards careers in professional engineering roles or as engineering technicians.

There are three core elements to the Programme:

* *to support a network of schools and colleges across Northern Ireland, which have been identified working closely with the NI Department for the Economy*
* *A £15,000 bursary targeted at NI resident women students from low-income households, and those who are under-represented in the engineering sector, in their first year of a university in an engineering related degree*
* *A £2,000 bursary to support young women studying engineering or engineering-related subjects at A-level and vocational engineering qualifications*

The Programme is delivered by the Royal Academy for Engineering (RAEng). It is a charity and not-for-profit organisation which has a responsibility to deliver public benefit from engineering excellence and technology innovation. It is a national academy and provides leadership for engineering and technology, and independent expert advice to government, in the UK and beyond. It has considerable experience in running long-term, targeted interventions to improve the outcomes for young people. A grant agreement has been signed between the RAEng and Department for the Economy (DfE) to deliver the activities and meet the Programme Objectives.

The total cost of the Engineering Education Pilot Programme across Northern Ireland is £500,000 (modelled on delivery in two other UK regions) for the period 1 March 2022 to 30 July 2023 and is funded by the Department for the Economy. Recognising that the bursary award elements of the pilot will extend beyond this term, it was agreed that the RAEng would manage the bursary fund as required and continue to distribute funds beyond this date. It is resourced by a full-time Programme Manager who is supported by a Senior Programme Manager and the Head of Education Programmes.

In addition, the Academy provides several additional supporting elements to the Programme through its various teams and senior leadership including:

* Review of grant/bursary applications – colleagues in the Education Team and Policy Team
* Planning & delivering celebration event – colleagues including the Senior Leadership Team, the Events Team, Education Team, Public Engagement Team, Enterprise Team
* On the ground support to deliver activities/public engagement/industry engagement – Enterprise Team
* Production of brochures/website updates – colleagues in Comms Team

## Evaluation Terms of Reference

Maureen O’Reilly was commissioned to undertake an evaluation of the pilot year of the Northern Ireland Engineering Education Programme to understand the emerging impact of the engineering education activities offered within the primary, post primary schools and further education colleges engaged in the programme, as well as the administration of the post-16 bursary by the in-school coordinators and HE bursary provided through the programme.

The Evaluation has focused on emerging impact within four areas of the project:

* Experiences of the bursary awardees with respect to their studies in the field of engineering and to determine the extent to which the higher education bursary have impacted the studies of the awardees through examination of end of year reports submitted to the Academy by the awardees as well as through interviews and/or focus groups.
* Activities undertaken by the schools/colleges to determine the extent to which these activities have impacted the students and school community through examination of end of year reports submitted to the Academy by the in-school coordinators as well as through interviews and/or online surveys.
* Experiences of teachers who have not engaged or not engaged fully with the programme to understand the barriers to participation through interviews and/or online surveys.
* Experiences of the students who have benefitted from activities delivered through the programme through the examination of end of year reports and where appropriate online surveys.

Maureen O Reilly has liaised with the locally appointed Programme Manager, Bronagh Ward, with regards to programme delivery, monitoring, and evaluation. The evaluation approach has involved interviews with teachers, bursary students and key stakeholders including DfE. It has also involved a survey of the Post 16 bursary recipients. There has been an extensive review of Programme materials as well as the end of year reports for schools and students.

# The Origins & Development of the NIEEP

The Women in STEM Steering Group was convened in October 2020 to provide advice and strategic oversight to the Department for the Economy (DfE) in developing and implementing the recommendations outlined in the Matrix 2018 Women in STEM Report *“To have more girls participating in STEM education and STEM employment and that more STEM employers are fully inclusive and representative of a diverse workforce. Furthermore, that by 2030, 30% of all young people moving into STEM are girls”.* This led to the Northern Ireland Women in STEM Action Plan which focused on the urgent need for the education system to enhance the support offered to young people to make better informed choices in the potential for the many varied and rewarding STEM pathways. The action plan also presented solutions to better support women in STEM careers.

In June 2021, the steering group endorsed projects to go forward in a Departmental bid for funding through the Economic Recovery Action Plan (ERAP). There were three elements to the ERAP project, Raising Aspiration in STEM Education and Careers - Project RAISE. They have included:

* 1. **Northern Ireland Engineering Education Pilot** - delivered by the RAEng - focused STEM education support and careers guidance for students and teachers over a sustained period from early years, primary through post-primary and into tertiary education.
	2. **Northern Ireland STEM Learning Project** – enhance STEM teacher confidence by Incentivised bursary funded intensive CPD and Northern Ireland relevant industry engagement through local Enthuse Partnerships and Teacher placements.
	3. **STEM Engagement via TikTok** – involving the curation of content from existing resources and creation of new content around Pulsar and Matrix sponsored events to improve the visibility of STEM careers for young people using a proven engagement platform.

From a strategic perspective, the NIEEP supported several DfE Strategies and Policies including its Economic Recovery Action Plan (ERAP), 10X Vision, Draft Women in STEM Action Plan and the draft Gender Equality Strategy as well as the wider strategies and workstreams within and across Government Departments including Education.

The Department and latterly the Women in STEM Steering Group (WISTEM-SG) had looked at the STEM pipeline in terms of age and where the points of intervention were to try to find out where the gaps were in delivery noting little change for decades. The Academy had pointed out several existing programmes. They included:

* The Welsh Valleys Engineering Project (WVEP), delivering STEM education support to students and teachers by the Academy. It was launched in March 2018, funded by the Panasonic Trust – delivered to eight post-primary schools, two colleges and five primary schools located in Merthyr Tydfil and Blaenau Gwent, South Wales. This was expanded to all fifty-four schools in these two areas in 2021 after a successful funding application to the Welsh Government. The expansion focused on employer engagement.
* The Lord Bhattacharyya Engineering Education Programme (LBEEP) which is the West Midlands programme launched in March 2020, funded by Department for Science, Innovation and Technology (DSIT). It is delivered to twenty-five post-primary schools and FE colleges located in the Birmingham, Coventry, and Warwickshire areas.
* The Barrow Engineering Project – Launched April 2008 with the Academy involved until 2018 when it was handed over to the local Furness Education and Skills Partnership (FESP). This was delivered to ten primary, five post-primary and one college located in Barrow in Furness.

The experience and approaches here formed the basis for the development of a Programme in Northern Ireland with the objective of raising aspirations around studying engineering for all young people but particularly for girls and to support young women from low-income families to continue STEM education and pursue rewarding STEM careers. DfE worked with the Academy to develop a programme with those objectives. DfE’s original aspiration was that this would be more long term so not just a one-year pilot, with the idea for continuity of the Programme through a sustained funding model through education.

The Business Case set out the following activities and outputs for the pilot:

* Fifty-two schools and colleges recruited, located in four key clusters across Northern Ireland, each comprised of eight primary schools, four post-primary schools and one further education college (FE).
* Sixteen local employers engaged in the programme, four per cluster.
* £3,000 of in-house grant funding per school/college to enhance the E in STEM, mark Tomorrow’s Engineers Week and NI Science Festival, and to establish and/or resource existing STEM clubs.
* One STEM Challenge Day/Workshop per year for each of the primary and post-primary schools participating.
* Up to 8,200 STEM learning opportunities provided to students from Reception-Key Stage 5.
* Thirty bursaries worth £2,000 (paid over two years) to incentivise post-16 STEM study among women students from low-income households.
* Eight bursaries worth £15,000 (paid over three years) awarded to women from low-income households studying engineering at degree level.
* One network meeting per term to encourage collaboration and share best-practice.
* CPD for primary and post-primary school teachers on Academy STEM resources, released twice per year.

# Programme Elements, Operation & Impact

## Introduction

As noted above, there are 3 core elements to the Programme. They involve:

1) Grants to schools/colleges to purchase resources that focus on engineering in STEM

2) Higher Education bursary support for women Engineering Students

3) Post 16 bursary support for women students studying engineering or engineering-related subjects at A-level and vocational engineering qualifications.

Specifically, the Programme sets out to provide a range of supports to schools and colleges including:

* up to £3,000 of in-house grants to its network of schools and colleges to purchase resources and provide experiences for students that will enhance the ‘E’ in STEM, and to celebrate national events such as Tomorrow’s Engineers Week and NI Science Festival.
* STEM Challenge Days for students to excite, inspire, and stimulate interest.
* access to a peer-to-peer support network for our STEM teachers, providing the opportunity to share resources and best practice.
* teacher CPD and Academy educational resources to introduce students to real-world engineering.
* thirty Further Education bursaries, each worth £2,000, to incentivise post-16 STEM study among women from low-income households.
* eight Higher Education bursaries, each worth £15,000, to support women students who will study engineering or related subjects at a UK university.
* industry collaboration to share best practice and engender a supportive, sustainable network.

To set the context for the current position of the Programme at this interim stage, a key milestones timetable has been set out below from the launch of the Programme in April 2022 to the more recent launch of the Post 16 bursary in January 2023.

*Key Milestones - Timetable*

|  |  |
| --- | --- |
| Programme Timeline | Month/Year |
| Programme Launch | Spring 2022 |
| Initial invitations to participate in the Northern Ireland Engineering Education Programme | April 2022 ongoing |
| Commencement of school visits | May 2022 ongoing |
| First Launch of HE bursary | July 2022 |
| Second Launch of HE bursary | December 2022 |
| Proposed Launch of Post 16 bursary | October 2022 |
| Actual Launch of Post 16 bursary | January 2023 |

The evolution and progress of each of these core elements is discussed in more detail below.

## In-House Grants

*Background*

The in-house grant element of the Programme was created to encourage a collaborative culture of engineering across the local community to allow young people to access a *‘continuum of STEM experiences that raise aspirations and enrich the curriculum throughout the whole of their education, from primary school to sixth form and beyond’[[3]](#footnote-4).* The concept is that by linking networks of schools/colleges to locally based STEM employers, universities and other stakeholders, it would raise students’ skills levels and provide links to real-world engineering, supporting and enhancing knowledge of engineering careers and the pathways available to them.

*Approach*

The Programme set out to create ‘clusters’ of schools/colleges to support the development of a platform to share resources and encourage students in STEM and particularly engineering through their school/college journey. In-school coordinators would be engaged to act as liaison with the Programme Manager and take forward the Programme in schools. The approach involves up to £3,000 of in-house grants to purchase resources to enhance the ‘E’ in the STEM curriculum and to celebrate national events such as Tomorrow’s Engineering Week in November and NI Science Festival in February. Other strands of activities for schools included access to peer-to-peer support networks for STEM teachers, teacher CPD and Academy educational resources which introduce students to real-world engineering. In addition, the Programme targets industry collaboration to share best practice and engender a supportive, sustainable network. This happened organically within schools who were already working with local industry/companies and were able to link those businesses into their applications. This informed how the Programme Manager might connect industry to schools based more on projects and not just location. For more recent recruits the Programme Manager has suggested schools propose the industries they most want to work with based on projects and feedback from students after work experience.

The process has also involved bringing teachers together to facilitate the sharing of ideas to help understand how grants could be best used including highlighting examples of where materials worked best for others, particularly in Primary Schools.

*Recruitment & Retention*

The original aim was to recruit fifty-two schools and colleges in four cluster areas with each cluster comprising eight Primary Schools, four post-primary Schools. and one FE College. These relate to the broad geographies of Omagh/Enniskillen, Belfast/Newtownabbey, Newry/Craigavon and Lisburn/Downpatrick which were decided following a workshop held on 3rd March at Ormeau Baths, where twenty-four post-primary schools in four geographical clusters across Northern Ireland were identified to potentially take part in the project. Letters were sent to the headteachers in all these schools inviting them to participate on a first come, first served basis. As part of the recruitment drive, the post-primary schools were given the opportunity to nominate two of their feeder primary schools to also take part. In proposing the four pilot clusters the following was considered:

* Location of Advanced Manufacturing, Materials and Engineering (AMME) companies and associated jobs
* Data on areas of deprivation
* Data on free school meal entitlement as an indicator of deprivation
* Religion, Gender, Age, Grammar
* The location of Enthuse partnerships
* The concentration of existing effort, which isn’t evenly distributed, and avoided areas such as Greater Belfast and Derry to avoid duplication

At this point in the Programme (July 2023), twelve schools have fully participated with twenty further schools at varying stages in the grant application process. Some of these had applications approved in July 2023 ready to commence activity at the start of the 2023/24 academic year, and others are being supported to complete their applications. Of the thirty-two that are participating, two are FE colleges, fifteen are post-primary schools and fifteen are primary schools. Every cluster has some schools involved so no one cluster has been fully established yet. There is particularly strong involvement from the Newry/Craigavon cluster while the lowest number of participants is in Lisburn/Downpatrick cluster. To provide some examples of the challenges in school recruitment, one school was engaged with through one of their Board of Governors who has a background in Engineering. The Programme Manager visited the school to speak with the Career’s teacher. Although initially interested there was a lack of confidence in what the school would have to do, and limited engagement from the departments that would have to deliver the projects. The school has high levels of engagement in Drama/Performing Art & Sports. Another example is a principal who was new in post and did not wish to take on extra workload within the school at this stage.

A submission has been made to reduce the number of schools/colleges to forty-two within four clusters. This would support the Programme to provide another round of funding to the twelve schools who have completed their activities in the Academic Year 2022/23 to support them to undertake further activities in 2023/24 and allow the Programme to ascertain the impact of this additional funding compared to schools that have had just one round. This involves seven primary and five post-primaries. The final formation of these four Clusters will depend on engagement within each Cluster and where participating schools and colleges are based. The Programme team suggest that some might partner better outside of the planned regional boundaries. There is one cluster of fourteen that can be split and partnered with adjoining clusters if numbers are low.

The reason for the slower recruitment of schools/colleges put forward by the Programme team involves several factors including school readjustment after COVID, industrial action taking place, restrictive budgets and teachers who are very stretched and finding it challenging to take on new projects. It can be challenging for teachers to navigate the programme alongside the ‘day to day’ job of teaching. School finance systems are not used to dealing with external financing and that has slowed up the bursary process. There were also internal Programme delivery challenges including the delay with the recruitment of the Programme Manager at the outset, putting a new programme in place and simply following the process required to secure an MoU with schools and follow through to direct engagement.

*Review of ‘End of Year’ Reports*

Fifteen schools and colleges submitted end of year Reports for the 2023/24 academic year. Six were primary schools, seven post-primary, one Grammar and one College. Eleven had accompanying expenditure reports. Participants provided details on funded projects, how many students and teachers are involved, what impact the programme has had, details of any employer engagement and photographs and social media content related to the Programme formed the basis of these reports.

In total, the reports suggest that £38,075 has been provided in grant support. In addition, some schools/colleges have provided additional financial support of around £3,500 which includes a sizeable amount of matched funding from one post-primary school of £2,382. This suggests that the additional contribution of schools is for the most part very low.

Ten of the fifteen schools/colleges had fully complete information on the extent of student and teacher engagement on the Programme in their End of Year reports. Information was not available for the others largely because of delays in starting the Programme until September 2023, due to the staggered nature of schools joining up to the programme, which meant aspects of the grant support had not yet been implemented.

The Primary school engagement has involved all age groups, but particularly P5 to P7. Post-primary schools have largely involved classes up to Year 12.

In terms of participant student and teacher engagement, the reports highlight that at the point of reporting the Programme has engaged with around 2,300 student learning opportunities (the number of students engaged in each activity) for the 10 schools with full information (this is closer to 2,500 including partial information from others). This is split 52% boys and 48% girls. There are slightly more learning opportunities in Primary (54%) than post-primary (46%) with a small number recorded by one college. The average number of student learning experiences per school/college is 230. This would mean that if forty-two schools were involved eventually in the Programme, this could amount to almost 10,000 learning opportunities if the level of engagement to date is used to forecast future performance. However, it would be important to understand and monitor these numbers over time to understand uptake and progress.

***Student Engagement – 2022/23 Year End Reports***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Boys | Girls | Total | Average Per School | Number of Schoolswith full data |
| Primary Schools | 674 | 559 | 1,233 | 247 | 5 |
| Post-primary/Grammar Schools | 507 | 545 | 1,052 | 263 | 4 |
| College | 14 | 3 | 17 | 17 | 1 |
| *Total Learning Opportunities* | *1,195* | *1,107* | *2,302* | *230* | *10* |

*Source: End of Year Reports*

From a teacher perspective, there have been 112 teaching learning opportunities connected to student engagement, with 56% connected to Primary Schools.

***Teacher Engagement – 2022/23 Year End Reports***

|  |  |
| --- | --- |
|  | Number |
| Primary School | 63 |
| Post-primary School | 47 |
| College | 2 |
| *Total Teaching Learning Opportunities* | *112* |

*Source: End of Year Reports*

Course materials purchased with the grant have included, for example, Lego coding kits, resources to deliver a ‘sustainable living’ project, a 3D printer and circuits equipment, both to be used in an after-school club. Students have been involved with Tomorrow’s Engineers Week and the NI Science Festival and Engineering Days. There appears to be a wide variety of materials/uses to which the grant has been put.

Observations on the impact of the Programme to date in teacher feedback included:

* A very positive overall assessment of the programme and its contribution in supporting the curriculum.
* The practical hands-on experience the materials provided in the application of STEM/Engineering.
* Supporting students identify career pathways and opportunities in Engineering and STEM.
* Addressing students’ inequalities in supporting understanding of and access to engineering and STEM studies and careers.
* Exposure to significant environmental issues including the role of renewable energy.
* Enhancing transferable skills including communications, problem solving and working as a team.

Some direct examples of positive impact include the opportunity for one school given to a group of girls called ‘girls in construction’ involving a trip during school that allowed girls to have an insight of construction i.e., tiling, plumbing, brick laying and bench joinery. Another school noted the link to industry which led to work placement offers and successful higher-level apprenticeships. Students also had the opportunity to present the project at the Queen’s sustainability challenge and civic centre.

Employer engagement was relatively limited at this point, as anticipated. The College respondent did note that while there was no employer engagement, learners who took part in using the NIEEP activities are apprentices within a range of employers from fabrication and welding to sustainability to fitting activities.

A few challenges to participation were noted including some specific to the programme including the timing of funding coming in and impacting on the ability to complete the project, staff needing to promote participation in the Programme more to try and encourage more students to enter for the next academic year, staffing needing to promote the bursary more and encourage more students to apply in coming years and from a school perspective finding it difficult to get iPads from other classes to use the resources purchased with the bursary. *School & Teacher Evaluation Feedback*

Teachers interviewed as part of this evaluation highlighted that there is a clear drive within the participant schools to enhance their involvement in STEM. Feedback from them highlights the importance of the Programme in supporting their STEM school focus. They rate the resource boxes highly and the highly practical nature of them support is a significant plus for students. Schools noted that it provided a ‘different way’ to support students with the curriculum because of its practical application compared to the mainstream assignment approach. The schools found them straightforward to use and a significant help with the curriculum. They stated that the children enjoyed them immensely. A couple of schools pointed out their importance to autistic children particularly. One school noted that it encouraged them to purchase materials they might have thought unsuitable for primary level and others who simply would not have known about them without the NIEEP programme.

Schools highlighted that it was great to ‘own’ resources rather than borrowing them. Some schools are considering buying further resources because they rated them so highly. The primary school visits to post-primary schools and meeting with bursary students appeared to work well, as has engagement with the private sector e.g., NIEEP coordination of a private sector company visit with one school demonstrating robotics. Teacher training (e.g., Future of Flight course) was rated highly by one teacher in supporting the teacher’s understanding of engineering. It appears that schools would not have access to these resources without the Programme because budgets have been cut, a view that this isn’t a policy priority and internal resources are very stretched, highlighting the additionality of the Programme in the absence of mainstream support. Teacher comments suggest that the children would benefit from a lot more of these resources. There was a sense of innovation from some teachers in planning how to use the grant going forward e.g., one wanted to explore a sustainable materials project. Getting to know and work with other teachers is also considered a positive. This was particularly the case in working between primary and post primary.

A particular observation is around the importance of individual teacher buy-in to the Programme. Teachers tend to be more engaged and strongly enthusiastic where:

 1) this is an explicit focus in their job.

2) where they have a STEM type background.

One teacher noted that they were ‘STEM’ in the school and much falls to that one person. There was a view that schools themselves need to do more. This is a constraint and affects the timeliness of the NIEEP engagement process.

*Teacher Comments include ….*

|  |
| --- |
| *‘Would never have been able to buy the resources without the funding’.**‘Overall, very happy. Nice to have some more support from professionals. Training aspects of videos was very good. Nice to have more of them!!’**‘Definitely helping tech and design in this school – showcasing it as an important subject area’**‘We constrained by our budget, so this extra resource is a significant boost’**‘Promoting girts into STEM as it is still hard. A lot of kids coming into school would be driven by what their friends do so is hard for girls to deviate from this’**‘Think this helped them through the year. Was really positive and considered a ‘reward’. These girls’ backgrounds are tough, so this is an incentive’.**‘A lot of students hate team working but this supported them to work together in teams with again the practicality kicking in’**‘Used resource boxes as team building activities. Good at different points in year when students struggling and could bring students back into it and more interesting. Adds extra dimension’.**‘Benefits that money and resources has been to children with additional needs – autistic children who find it hard to focus – sphero ball great for this. And the Connectix – so good for them and the way their minds work!!’**‘Just how much appreciate opportunity to have resources would never have had and bring it to the fore more. Even in doing simple things leading children in that direction’.**‘Girls are definitely thinking more about doing GCSE engineering – asking about this and what jobs they could go into’.* |

*Engagement with Industry*

The Programme has set out to engage with industry by engaging with four employers per cluster so sixteen in total. The inclusion of business in the ‘cluster’ model was driven by evidence suggesting a tendency for business engagement in STEM to focus on certain schools, specifically grammar schools, meaning a typically lower exposure to the application of STEM and Engineering principles in work to post-primary schools. The idea therefore is that involving industry with schools at all levels, policy is intervening to make the whole process of STEM/Engineering exposure more equitable across all types of school provision in Northern Ireland. The direct inclusion of industry links in the application process, supporting schools with grant proposals and on-going engagement through the Programme has aimed to provide an opportunity to widen outreach and networks for all schools involved. Therefore, businesses have been involved with developing schools’ grant proposals as seen in the in-house grant applications.

At present, 10 employers are now connected with the Programme. With schools coming on board later than anticipated, there have been knock-on effects in terms of industry engagement. The focus on the Programme to date has been on the school engagement piece (along with bursaries) and making sure that schools were fully participating, and projects developed. This has been considered an important pre-cursor in making sure that there is a firm foundation with schools before engaging with industry, particularly in ensuring their ongoing engagement. With school engagement and projects more firmly established, it is envisaged that from November 2023 there will be a greater focus on the link-up between businesses and STEM ambassadors.

## Higher Education Bursary

The Higher Education bursary forms part of the NIEEP and is targeted at women students from low-income households, and those who are under-represented in the engineering sector. This involves the opportunity for women students to apply for a £15,000 bursary to support their studies and has been open to students who have enrolled in their first year of an engineering or engineering-related subject at degree level and be a resident of Northern Ireland. 'Engineering-related' includes subjects such as Computer Science, Technology with Design, Physics or Maths. The criteria states that ‘*successful applicants will be able to show an understanding of how their chosen subject can lead to a career in engineering and should ideally be looking to follow a career in the field after graduating’.*

The main objectives of the Higher Education bursary programme are:

1. To encourage women students from low-income households and those underrepresented in the engineering sector to become valuable members of the future STEM and engineering workforce.
2. To support local students' progression from eligible schools and colleges in Northern Ireland to higher education as they continue their STEM studies at degree level.
3. To help address the well-documented shortage of engineers by promoting greater diversity and inclusion in engineering across the UK and Ireland.

The process involves an application through the Academy’s online Grant Management System (GMS**).** The main purpose of the application form is to identify whether the student has met the eligibility criteria and the aims and objectives of the scheme. The process is clearly set out, involving completion of the application online, which is then reviewed by an RAEng Panel. Any unsuccessful applicants are informed and successful applicants called for interview, after which they would be informed as to whether they will be awarded the grant.

At the outset, the first preference bursaries were to be given to those students in receipt of free school meals (FSM) and/or parents in receipt of benefits as evidenced by supporting paperwork submitted with their application.

There was some delay to the implementation of the bursary process brought about by technical issues with the online grants system which meant the deadline for applications was extended by one month to the end of August 2022. There was also lower-than-expected take up with eight places available and only three applications submitted at that time. Reasons put forward for the lower uptake were timing - in that it was launched towards the end of a very busy school year - and visibility - in that the communications around the bursary meant that it was not fully picked up by schools.

It was subsequently decided that the scheme would be re-opened, *‘with eligibility criteria widened, to give more women students the opportunity to apply for the remaining five bursaries’.* This was considered in agreement with DfE. The scheme was relaunched in December 2022 with a new deadline set for 4th January 2023.

A discussion took place between RAEng and DfE[[4]](#footnote-5) around consideration of the replacement of the requirement to provide a benefit statement with alternative evidence to demonstrate hardship e.g., letters for maintenance grant/official award notification of similar hardship payments/loan. This would ensure the NI programme would remain consistent with other RAEng programmes. The rationale for change was that candidates (having already started HE study) would now be able to provide different evidence e.g., they may have already submitted benefit statements to apply for maintenance grant. A grant award letter would therefore confirm that the institution has verified eligibility. The new criteria set by the Head of Education in RAEng and agreed by DfE was as follows[[5]](#footnote-6): To be eligible, the student must answer 'yes' to one, or both, of the following:

* *Had been continually eligible for free school meals since the start of your post-16 studies - even if you didn't actually receive them.*
* *Be in receipt of any kind of funding - scholarship, bursary or grant, either from your university or the government, that was awarded on your personal or household financial situation. This could include a low-income scholarship or bursary from your university either paid to you or towards your accommodation, a fee waiver, a hardship grant, a non-repayable maintenance grant, a means-tested maintenance loan from Student Finance NI etc, if the criteria on which these awards were made was low income or hardship.*

The application process asked to provide evidence of any such funding, in the form of an official award notification letter if the application was successful.

Applications were particularly welcome from students who met the criteria **above** and could also answer ‘yes’ to one or more of the following:

* Spent time in the local authority care system.
* Be the first generation in your immediate family to attend university/higher education.
* Have not attended a fee-paying school at any time since the age of 11 (except where in receipt of a scholarship).

As well as meeting the criteria, students had to demonstrate through the application their interest and passion for engineering,

A concerted effort was made to raise the profile of the bursary including working with STEMNI who had access to school contact details, Women in Engineering and the Education Authority. In total, four further applications were received that went through the shortlisting and interview process. All four were offered the bursary. This means that in total, seven bursaries were awarded amounting to £105,000. It was agreed that the remaining £15,000 for one bursary not assigned would be redistributed to other aspects of the Programme. It was reallocated towards providing schools with Future of Flight resource boxes on top of their water resource box and supported a celebration event.

***Bursaries Awarded Under the NIEEP Programme***

|  |  |  |
| --- | --- | --- |
|  | Number | Degree Choice |
| Number of bursaries awarded in 1st application phase | 3 | * 2 studying Biomedical Engineering at UU
* 1 studying Mechanical and Manufacturing Engineering at UU
 |
| Number of bursaries awarded in 2nd application phase | 4 | * 1 studying Physics in York
* 1 studying Physics in London
* 1 studying Engineering in Dublin
* 1 studying Computer Science in Liverpool
 |

The criteria change means that it is not straightforward to set out how they have been met. However, the table below gives a sense of what was ‘ticked’ during the application process.

***Bursary Students & the NIEEP Criteria***

|  |  |
| --- | --- |
|  | Bursary Student |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Parents on State Benefits | T | T | T |  |  |  |  |
| Eligible for FSMs | Not clear | Not clear | T |  | T |  |  |
| First generation at higher education | T |  |  | T | T |  |  |
| In receipt of funding either university/government |  |  |  | T | T | T | T |

*Source: Bursary Application Forms*

Two of the four students in the second bursary call ticked just one box which was that they were in receipt of either university and/or government funding. It is notable that evidence of eligibility did not appear to be provided in a consistent manner. The first three applicants had reference numbers related to benefits. This was not in the documentation for the second round of applicants as the eligibility criteria had changed in line with other Academy programmes.

First Call:

**To be eligible, you must also be able to tick one, or both, of the following. You will need to provide evidence of this in the section below.**

 I have a parent/guardian in receipt of state benefits.

**Please upload official documentation to evidence each of the statements you ticked in the previous question.**

Second Call:

Please note that you will be asked to provide evidence of any such funding, in the form of an official award notification letter, if your application is successful. This could be a low-income scholarship or bursary from your university either paid to you or towards your accommodation, a fee waiver, a hardship grant, a non-repayable maintenance grant, a means-tested maintenance loan from Student Finance NI.

If you do not meet the eligibility, please refer to any other relevant evidence that would support your application.

I am in receipt of funding either from my university or the government

Also, addition of the following in the second call

We especially welcome applications from students who can answer yes to any of the following.

Please tick any that apply to you; however, these do not affect your eligibility to apply for the bursary

* I have NOT attended a fee-paying school at any time since the age of 11
* I am the first generation in my immediate family to progress to higher education

A review of the HE bursary Year 1 End of Year reports provide an indication of what the students have spent the bursary on. This includes buying laptops, books, living expenses including rent, allowing them to cut back on paid work, paying university fees, and a number mentioned general peace of mind. A couple of students said that the laptop helped them install software on their computer that they otherwise wouldn’t have been able to. One student said they were able to secure an SSE Scholarship because of the confidence securing the HE bursary had given them. The End of Year reports are very qualitative in approach asking students how their studies are progressing, the impact of the bursary and their future career, work experience and placement opportunities. They give students an opportunity to demonstrate how their course is going, challenges and opportunities and what their plans are going forward.

Three of the bursary recipients were interviewed as part of this evaluation. The overall rating of the bursary application process was high, finding it clear and transparent and the Programme Manager helpful and supportive. A snapshot of the student journeys is as follows:

|  |
| --- |
| *Student 1 had chosen to study Physics in England. She had a strong interest in her chosen subject and wanted to pursue it because it gave her a range of options in terms of future career choices. She went back to her school for an awards ceremony and her former teacher made her aware of the bursary as they had discussed the expense of studying in England. She did not meet the FSM criteria but was the first in her family to attend University. She believes if she had not received the bursary, she would not have been able to continue her studies in England given the expense.*  |
|  |
| *Student 2 had chosen to study in Physics in England, again because of her enjoyment of the subject and its wider ranging application in terms of a career. Her school had sent out email after she left the school so decided to apply. She qualified both in terms of accessing FSM and as the first generation in her house to attend university. She said the grant has supported her to focus on her course as otherwise she would have had to take on a number of jobs to live away. She was very supportive of the Programme, especially for 6th formers and believes that early promotion is key. She noted that 80% of students on her course are men and thinks it is really important to promote women in STEM. Engagement as a woman on her course can be difficult, including with lecturers.* |
|  |
| *Student 3 is studying Engineering at Trinity in Dublin. She had considered a career in medicine but really enjoyed Maths and Chemistry and her careers teacher mentioned engineering. She found out about the bursary at A Level prize giving when the new Physics teacher made the announcement. The bursary has given her an opportunity to ‘step back’ and concentrate on the course. The course is very intensive, involving full days with course work and lab work involved. She had been tutoring to cover costs. She notes that around 35% of her course are women. This can be challenging if she is the only woman in group work.*  |

The Programme Manager keeps in contact with the students and is in discussion around next steps in their engagement with the Programme.

## Post 16 Bursary

The Post 16 bursary scheme forms part of the NIEEP. It aims to ‘*support young women with a passion for engineering and an idea of where an engineering qualification will lead them’*. The main objectives of this element of the Programme are to:

* Encourage women students to become valuable members of the engineering workforce in the future.
* Support the progression of women students to continue their studies in an engineering or engineering-related subject.
* Help address the UK's shortage of engineers by promoting greater diversity and inclusion in UK engineering.

At the outset up to thirty bursaries were to be awarded over the 2022/23 academic year to women students studying STEM subjects at A-level, and level three vocational engineering qualifications (e.g., BTEC and OCRs). The amount awarded is £2,000 over the two years of their study. There are some conditions attached to the bursary from both a student and institutional perspective. They include:

* All students are asked to be Ambassadors for the scheme to encourage next year’s students to apply.
* It is each institution’s responsibility to monitor the conditions of ongoing receipt of the award, namely that each awardeemaintains full (95%) attendance and passes their first year of study. If they don’t, then the bursary is no longer payable.

 Teachers sign a letter of agreement, with the payment schedule as follows:

* + Year 1:
		- April 2023: £700
		- June 2023: £300
	+ Year 2:
		- September 2023: £350
		- January 2024: £350
		- May 2024: £300

In terms of criteria, the bursary is open to students who:

* Reside in the Northern Ireland[[6]](#footnote-7)
* Meet **one or both** of the following:
	+ have a parent/guardian in receipt of state benefits
	+ be eligible for free school meals
* Are beginning full-time Level 3 vocational engineering qualifications (such as BTECs and OCRs), or A Levels where students demonstrate an ambition for pursuing further studies in engineering or a future engineering career.

The students must complete an interview process that focuses on the following questions:

1. What interests you in engineering, and the course/subject you are studying?
2. What are your long-term plans in terms of further study and/or your career?
3. How would the Award help you to pursue these plans?
4. All successful Award holders may be asked to act as Ambassadors for the scheme to encourage next year’s students to apply. What sorts of things would you suggest the Award holders could do to act as Ambassadors for the scheme?
5. Have you identified any specific opportunities or activities that you could participate in that may support your studies in engineering?
6. Being an engineer requires a set of sometimes quite unique skills such as creative thinking and problem solving, as well as team working and good communication skills. Can you tell us about a time where you have demonstrated any of these skills, either in, or out of, school or college?
7. Why should you be one of the students to be awarded a post-16 bursary this year?

Colleges, schools and coordinators are responsible for alerting eligible students and facilitating the application process with support from the Programme Manager. The coordinators shortlist applications through a scoring process and conduct interviews. The Programme Manager offers to support all interviews at the request of in-school coordinators and time permitting. Most interviews were conducted by the in-school coordinators & another member of teaching staff. Bronagh took part in interviews in St Ronan’s as second interviewer.

The Post 16 bursary was set to be launched in October 2022 and was subsequently launched in January 2023 with the process of awarding to conclude at the end of February 2023. To date, nineteen full bursaries have been awarded across five schools and one college. Additionally, two half bursaries were awarded to year 14 students at one post-primary school. All of those who applied received the bursary. There are no outstanding applications. This is lower than the 30 set out in the business case and Programme promotional material. Issues raised around the lower-than-expected uptake of the Post-16 bursary include lack of awareness by teachers/schools, challenges with teacher engagement and the strict criteria for the bursary in terms of ‘*aspirations to be an engineer’*.

The successful students were surveyed with two responses to date. Early observations include:

* The process was highly rated by the students.
* The students were going to use the money to support travelling to college/work experience which included working with a large Mid Ulster Engineering company (note: one student had not received the bursary yet).
* It was too early to consider what help the bursary could be. They did however connect it to the concept of engineering and its influence on their thinking around what aspect of engineering they would like to pursue.
* Although one said they would not be pursuing a career in engineering.

The Post 16 bursary is at very early stages. At this point, given the lag in timing, the plan is to launch for schools that did not have an uptake last year and award remaining 11 bursaries. The aim is to produce case studies of bursary awardees within each school, connect all awardees across the programme and allow the students to begin to build their peer-to-peer support network and introduce the post 16 bursary awardees to the HE bursary recipients. This will facilitate the student’s ability to promote the programme within their schools, across their cluster and throughout the network including within primary schools.

# Programme Review and recommendations

## Introduction

This section considers the findings of the evaluation in the context of the overall Programme objectives and how they are being met along with specific detail around delivery and impact in the three core elements of the Programme: In-House grants, Higher Education bursary, and Post 16 bursary.

It is important to note as context that this is a Pilot and it would be expected to take time to build up the Programme, understand the best way to approach schools, how to develop clusters and that reflects the importance of taking a pilot approach to trying different ways to deliver on the objectives of the Programme.

Appendix A provides a summary of progress towards meeting the Business Case and Programme Objectives. More detail around progress and impact to date is set out below.

## The In-House Grant

The in-house grant support element of the programme set out to include fifty-two schools/colleges across four clusters involving sixteen employers. To date, twelve schools have fully participated in the Programme with twenty further schools at varying stages in the grant application process. Of the thirty-two that are participating, two are FE colleges, sixteen are post-primary schools and fifteen are primary schools. No one cluster has been established yet. At this point, ten employers are involved to varying degrees.

There have been several issues that have delayed the engagement of schools, both internal and external to the Programme delivery. This has included the delayed appointment of the NIEEP Programme Manager following an unsuccessful first round of recruitment and setting up procedures and processes to engage with schools/colleges including the MOU. There have been several factors around school recruitment including school readjustment after COVID, industrial action taking place, restrictive budgets and teachers who are very stretched in their ‘day job’ and finding it challenging to take on new projects. These issues have been worked through although remain challenging which is in part reflected in the request to reduce the number of schools/colleges involved from fifty-two to forty-two.

A review of the 2022/23 End of Year reports by teachers highlights that grant support amounted to £38,075 at that point. There has been little additional funding from schools with one notable exception which matched the NIEEP grant. Of the fifteen schools that completed the End of Year reports, ten provided fully complete information on the extent of student and teacher engagement on the Programme in their end of year reports. These reports highlights that at the point of reporting the Programme has engaged with around 2,300 student learning opportunities (the number of students engaged in each activity) for the ten schools with full information (this is closer to 2,500 including partial information from others). This is split 52% boys and 48% girls. The average number of student learning experiences per school/college is 230. This would mean that if forty-two schools were involved eventually in the Programme, this could amount to almost 10,000 learning opportunities if the level of engagement to date is used to forecast future performance. However, it would be important to understand and monitor these numbers over time to understand uptake and progress.

For those teachers/schools involved to date, there is a strong sense of additionality with the Programme in supporting and developing the curriculum around STEM and engineering. It allows them to purchase materials that the schools would otherwise not have afforded to purchase. The Programme is highly rated with significant enthusiasm around its benefits including the Programme’s practical hands-on experience for students in the applications of Engineering/STEM, supporting the teachers ‘teach’ the curriculum, highlighting careers opportunities in Engineering/STEM and addressing inequalities in students’ exposure to and understanding of engineering as a career. Teachers also noted considerable transferable skills benefits for students including problem solving, communication and working as a team.

The Programme is also notable in supporting teachers to teach and improving their confidence in STEM which was noted by the Women in STEM Steering Group as a challenge. A number have received training in the resource boxes and further training sessions are planned.

The inclusion of Business/Industry is a strong part of the cluster approach to the Programme, addressing challenges in providing exposure and opportunity to students in schools that find it more difficult to attract interest from the sector. While still at early stages, there has been some positive feedback from schools about the interest and potential impact of this link including job opportunities for students after their studies.

Several observations and recommendations at this interim stage in the Programme are made as follows:

* *Engagement with Schools*

The evaluation has highlighted that there is an issue of initiating and maintaining engagement with schools. It has been challenging to raise awareness to recruit schools and this also links to the ongoing process to keep schools involved. For example, one post-primary College has recently had to withdraw and another is not active. One that was not as engaged is now fully involved. Ongoing issues include changing teacher roles, stretched staff/resources and there has been disruption around industrial action which the Programme Manager has had to work around.

Schools have been introduced at different stages and this has made regular meetings with the ‘cluster’ more difficult. However, as the Programme and school engagement becomes more settled this is now planned as a regular feature of the Programme.

* Engagement with teachers

A core element of the Programme is to boost the confidence and expand the knowledge of teachers. There is room for further expansion of this aspect of the Programme for CPD and continual learning and engagement. It would be helpful to have greater collaboration between teachers generally such as a Forum for sharing ideas and learning.

* Engagement with Business/Industry

The role of business/industry in the Programme is key and at this point in the pilot programme there should be more emphasis placed on their involvement with schools/colleges going forward. There should be a set of metrics to measure the extent of school involvement and to understand how they have influenced the students in their studies towards an engineering/STEM career.

* *Equitable Access*

A specific issue has been raised around access by some schools/students to aspects of the Programme that involve travel. Grant monies cannot be used for transport outside of the project scope. Transport costs should be included in their grant application and captured at this stage. There is not a supplementary fund within the programme that can be used for transport to events/activities outside of this being factored into grant submissions which limits certain children’s ability to participate. An example is attending the celebration event in Stranmillis in March where some schools wanted transport costs covered while other schools were able to absorb the costs within their school budget. One school had their own school bus, which helps, other schools got taxis, hired coaches and did not query costs/expenses for this. Given the ethos of the Programme around widening and equitable access, it would be useful to discuss exactly how transport costs can be covered in the Programme and communicate this to all schools/colleges involved.

* *Engagement with Careers Advisors*

Given the importance of profiling engineering as a career and the challenges for teachers of providing all aspects of support, the potential to engage with Career’s Advisors, internal and external to the schools/colleges, could be explored as a complimentary element to the NIEEP Programme.

* *The Cluster Model*

The original idea was that there would be four clusters of schools/colleges built around several primary, post-primary schools and colleges. It has taken time to establish how best to take this forward and it has proven more challenging that anticipated at the outset. Issues around school/college recruitment noted above has made it difficult to build the Cluster Model and the recommendation to reduce the number of schools/colleges involved from fifty-two to forty-two reflects this. It would be important to get at least one cluster developed as soon as possible to test out the different elements to the approach, particularly around employer engagement and peer-to-peer support.

Without this, it is difficult to take forward the networks and shared resource platforms that are at the core of the sustainable model approach.

* *The Application Process*

The application process has developed as the recruitment of schools has become established and bedded into the Programme. It would remain important to monitor all aspects of this process on an ongoing basis to consider timeliness of the application process from application through to acceptance and the timeliness of grant payments.

* *The End of Year Report*

A more detailed discussion is outlined below around the way in which the Programme is monitored and impact measured to date. The End of Year reports are a key part of that process but currently are very qualitative in nature and can tend to be repetitive. In addition, there is no opportunity to highlight the challenges with the Programme to understand how to address them (although the Programme Manager does have ongoing contact with schools/colleges). Considering recommendations below on impact measurement, the End of Year report format should be reviewed in content, format and how data is captured to support a more focused approach on activities, impact and challenges. This should be more helpful to schools/colleges in providing clarity around what should be captured and fed back on their Programme experience.

* *The Peer-To-Peer Support Network*

There is a strong emphasis in the Programme approach in supporting Peer-To-Peer networking and learning practices among teachers. Delays in the Programme have meant that this is not as well developed as was hoped. It is important that this is brought to the fore going forward and might benefit from a structured approach to how teachers engage with each other. Teacher CPD has taken place in the training provided through the Box resource (e.g., Future of Flight in February) and it would be important to record this as a programme output/impact.

* *The Role of Universities*

Links to Universities are mentioned as part of Programme engagement and it would be useful to report on the extent and nature of that engagement as part of the Programme reporting process. This already includes school visits with STEM learning opportunities and developing the networks that the Academy has already established. There are plans for increased engagement as the Programme develops and this should be captured as these relationships are built.

## HE Bursary

The Higher Education bursary grant has been positively received by students who found the application process straightforward and clear. They have used the support for various purposes from buying laptops and books to supporting them to cut back on paid part-time work to concentrate on their studies.

* *The lower-than-expected uptake in the HE Bursary*

The take up of the bursary was relatively low to the extent that there were two calls for applications, criteria change and in the end one bursary could not be awarded. There could be several reasons – lack of demand due to the criteria which says something about the extent of uptake of STEM/Engineering as a degree among more disadvantaged students and/or lack of awareness of the bursary’s existence which includes timing in that students had left school and therefore less engaged in the school process. It is interesting to note that one of the bursary recipients had several friends going on to study a STEM subject at HE but were unaware of the bursary award. The Programme Manager did approach the Education Authority and others to make sure they were targeting the right pool of people. Discussions with the Programme Manager of the RAEng’s Lord Bhattacharyya Engineering Education Programme highlighted their experience of the time taken to build up awareness among teachers, students and other stakeholders to grow applicant numbers but once established their numbers have grown both generally and in those who have received the Post 16 bursary then applying for the HE bursary. For example, the first Cohort for the LBEEP HE bursary application process secured just seven applicants but rose to nineteen by the 4th Cohort. For the Post 16 bursary, Cohort 1 secured twenty eligible applicants rising to thirty-one by Cohort 3.

* *The application of the HE Bursary criteria*

A review of the documentation around the bursary awardees suggests that the evidential follow up to demonstrate that applicants meet the criteria is not always provided, particularly among the second group of awardees. That they have met one or more of the criteria is typically taken on trust across wider RAEng programmes, particularly as applicants sign their application on that basis. Given the small numbers involved but large bursary size it would be useful to explore should more evidence be provided as part of the application process.

The change in criteria has brought the NIIEP into line with other RAEng Programmes. This reflects the fact that students are ‘adults’ and assessing economic status through parents may not be appropriate. This is why the new criteria around receipt of government/University support has been included. This is an important addition to the criteria, and it would be useful to understand this addition in how it applies to eligible HE bursary candidates.

* *Bursary impact*

It is hard to demonstrate the impact of the bursary, except for the fact that the recipients are recorded as having met a set of criteria that means they may have financial challenges and this award supports them to stay in their chosen degree course. This meets the objectives of the bursary award. The Programme Manager does keep in contact with recipients and this includes engaging with them in their involvement as ‘role models’ for future STEM undergraduates. For example, one HE bursary recipient attended the celebration event in March and gave a speech to the students about the impact the Bursary was making to her and how she was finding her first year at university. Another HE bursary awardee attended the Academy’s Annual Awards dinner in London representing the programme. A Post 16 Bursary awardee gave a speech at the celebration event. It is written in the Post 16 terms that they must be prepared to act as an ambassador for the NIEEP.

 In the medium to longer term, it will be important to maintain ongoing engagement with the recipients this will support an understanding of the future direction of their careers.

* *The value of the Bursary*

The origins of the £15,000 bursary amount is connected to an aspiration that students can be substantively supported to stay in their studies and the interviews suggest that this amount has provided security and support. Other Academy Higher Education programmes which influenced the NIEEP award also provide this amount:

* + - Engineering Leaders Scholarship - £5-10K to enhance personal development with suggestions on trips abroad, conferences, training, internships, language learning.
		- Amazon Future Engineer Bursary - £5k per year for up to four years of study to cover expenses related to attending university, including tuition fees, accommodation or living costs.

This is a substantive award. For example, a short review of Engineering Bursary suggests on average an award of £1,000 per annum[[7]](#footnote-8) although a number are higher. This makes it even more important that recipients meet the criteria focusing on those who would typically find sustaining their university place challenging and that they sign up to giving something back to the Programme in terms of driving awareness of Engineering to other students.

## Post 16 Bursary

The Post 16 bursary is at an early stage given that it was launched a few months later than anticipated. thirty bursaries have been allowed for. To date, eighteen have been awarded with two half bursaries. The process appears to have worked well, involving the school/college coordinators in the recruitment and application/decision making process. This direct engagement is a strength in supporting the in-house coordinator to ensure the bursaries are awarded to those that meet the criteria.

At this point, observations and recommendations focus on the bursary criteria and how that is met and monitored to inform the impacts set out for both the wider Programme and Post 16 bursary particularly. This includes:

* It would be important to fully understand the background of students accessing the bursary including how they meet the criteria in terms of FSMs/Parental Benefits.This will help build an important profile of bursary recipients.
* It would also be useful to review how students plan to spend the grant in their application form
* Are the in-school coordinators recording and communicating to the Programme Manager that the bursary recipients have the necessary attendance and have passed their first year of study?
* What Ambassador role is planned for Bursary students in encouraging next year’s intake?

Ultimately, the bursary is to support students to follow through to further education and/or a career in engineering and it would be important to follow up with those students at the end of their course studies to understand what is next for them. This is formally written into the Bursary Agreement with students.

## General Programme Considerations

The pilot phase of NIEEP was due to end on 31 July 2023. However, it was agreed with DfE to extend the pilot to 31 December 2023 to allow more time to reach the (amended) targets, due to challenges around school sign up. The Programme budget is £500k, fully funded by DfE. Details on current spend, commitment or future spend is part of RAEng contractual reporting to DfE.

There appears to have been good communication between the NIEEP Programme Manager and the Department for the Economy, exploring and testing approaches, developing contacts, developing materials, and making key decisions when required on core elements of the Programme such as the bursary. In terms of reporting this has involved regular Milestone Reports which have been submitted every quarter. There is also regular budget management reporting. Regular meetings take place every three weeks (was every three weeks up to May 2023) and minutes and agreed actions are subsequently disseminated.

There has also been strong engagement within RAEng who have provided support in terms of oversight, administration, planning and event organisation, grant/bursary application review and marketing and communications.

There is an identified and clear need for the Programme in filling a very significant gap in the number and quality of materials available to schools and students and its role in supporting schools to promote the importance of Engineering and STEM generally but particularly among women and among more disadvantaged students who are underrepresented in both. It was clear that teachers find these additional resources hugely helpful, particularly in taking a more practical approach to the subject which is particularly helpful with student engagement. The resources were not likely to be purchased using school funds highlighting not only their value added but also how limited existing resources and focus on engineering/STEM is in many schools. One comment was that this was being treated as a ‘luxury’ when in fact it should be thought of as a ‘necessity’.

The ‘Cluster’ approach aims to build skills and connections among both teachers and students and involve the business community at an early stage in the student’s exposure to how engineering/STEM can lead to a very fulfilling career. No clusters have been fully established yet but the concept when fully operational makes sense in terms of sharing of resources, best practice, networking, and teacher skills development. The role of business is particularly important in demonstrating career pathways.

There have been specific challenges with each element of the Programme which have been set out above. Other issues to consider in the Programme more widely include:

* *Communications*

The Communications piece is integral to all aspect of this Programme – engaging with teachers, engaging with students, involving business/industry and communication around the various events connected to the Programme. This involved the Programme Manager, RAEng, DfE and other key stakeholders. A dedicated Communications Plan identifying roles and resources would be useful to get a sense of the achievability of ambitions of the Programme.

* *Wider Involvement*

It is important to note that the NIEEP is a small pilot programme, testing out methods to develop understanding and interest in a very critical part of the future world of work. It cannot be viewed in isolation and therefore an appreciation of its role within the wider policy landscape would be important. There are existing relationships with the DfE, Matrix, WiSTEM and these should be built on as the Programme becomes more embedded in the STEM policy framework.

There is the opportunity for wider involvement of other Departments and stakeholders in the Programme. For example, at present the Programme does not include any direct involvement with the Department for Education. The Department did provide support in pinpointing schools to target for Free School Meals but there is no direct involvement in the delivery, oversight, and funding of the Programme. It would be useful to establish at this point in the Programme 1) where the STEM agenda is within the Education system e.g., STEM Advisors and 2) engagement with the Department on any potential role in supporting/expanding the Programme’s reach.

* *Measuring Impact*

Part of the evidence base in developing the Programme was the impact of existing regional programmes in places such as Barrow in Furness, the Welsh Valleys, and the West Midlands. They suggest impacts including higher rates of attainment and uptake in STEM subjects, improved perceptions of engineering careers, improved knowledge of pathways to engineering/STEM careers amongst teachers and pupils and enhanced employer advocacy. In addition, demand for college-level engineering courses within these regional programmes had increased; one college had launched two new engineering qualifications to meet demand, and another had seen their engineering cohort triple in size on one of their courses. This highlights the potential for the Programme in Northern Ireland.

The pilot phase of the Programme has focused to date largely on establishing relationships, establishing processes, governance and reporting, getting schools on board, getting the bursary elements of the Programme established. This has involved a significant amount of investment in time and resources. At this point it would be important to consider how to measure the outcomes and impact of the Programme in terms of meeting its objectives. The Business Case notes that a SMART methodology (Specific, Measurable, Achievable, Realistic and Time-Dependent) should be adopted by the Programme with targets related to these objectives, along with the current Baselinemeasure. This should involve the development of a specific set of metrics, potentially both hard and soft, that demonstrate change. This could include changing attitudes/perceptions of engineering as a career, career aspirations, career choices, increased demand within the educational systems for engineering/STEM as subject choices. From a teacher perspective, it could include improved confidence levels among teachers. Feedback to date has been largely qualitative (which does have a role as recognised in the Business Case), but it would be useful to include a metric/set of metrics that demonstrate that the schools/teachers/students have started out in their understanding and aspirations around engineering as a career and where they end up through the support of the Programme. The RAEng has already developed an evaluation tool for other programmes which could provide the template. They also have their Engineering UK Brand Monitor which could also provide a baseline and comparator for the NIEEP progress and impact.

In addition, using a platform such as SurveyMonkey means that the participant data can be held in a much more accessible and usable format.

* *Separation of Delivery from Programme Impact Monitoring*

It might be useful to consider separation of the responsibilities for Programme delivery with ongoing monitoring. This means that once a well-defined and communicated monitoring and impact process is established, a small amount of time/resource could focus on ensuring that the relevant data is captured to support the ongoing assessment of Programme outputs and impacts. This would ensure that the Programme Manager’s time is dedicated to driving the Programme agenda and fostering positive relationships with the key stakeholders in the Programme.

# Appendix A - Position to Date on Meeting Business Case and Programme Objectives

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| **Business Case Actions** | **Current Position** |
| 52 schools and colleges recruited, located in four key clusters across Northern Ireland, each comprised of 8 primary schools, 4 post-primary schools and 1 further education college (FE).  | 32 Current – 12 fully signed up & 20 at different stages.42 Target – planned reduction from 52It took longer than expected to recruit and onboard schools with the Lisburn area being the most challenging to engage with. Considering funding not being secured for the continuation of the programme a reduction in numbers from 52 to 42 would ensure that funding was available for the schools that completed projects in AY22/23 and allow for less resource needed for recruiting schools. This would also see all schools running projects during AY 23/24 and allow other elements of the programme (peer to peer support, cluster meeting, academy led workshops) become embedded.  |
| 16 local employers engaged in the programme, 4 per cluster | 10 CurrentPrioritised onboarding schools and getting projects established. Many schools included elements of employer engagement in their grant applications. The Programme Manager will work with these companies to bring them onto the programme officially and lead more engagement activities during AY23/24. The Programme Manager has been building relationships with key individuals with various local & regional companies and has identified potential links based on the types of projects the schools ran or intend to run.  |
| £3,000 of in-house grant funding per school/college per year to enhance the E in STEM, mark Tomorrow’s Engineers Week and NI Science Festival, and to establish and/or resource existing STEM clubs | Schools all had the same opportunity to apply for up to £3,000 and this did not change for first year funding throughout AY23/24 regardless of when schools were recruited. For schools receiving a second year of funding schools could apply for up to £2,500.  |
| One STEM Challenge Day/Workshop per year for each of the primary and post-primary schools participating | Schools preferred to organise this directly with Sentinus. All schools invited to the celebration day. |
| Up to 8,200 STEM learning opportunities provided to students from Reception-Key Stage 5 | 2,500 STEM learning opportunities currently based on 10 schools.Suggests on track to achieve target with 42 schools.Delivered through grant funded projects within schools, Sentinus Days, Celebration event. |
| 30 bursaries worth £2,000 (paid over two years) to incentivise post-16 STEM study among women students from low-income households | 20 currently – 20 students 19 full and two half BursariesNot having all the post-primary schools and colleges recruited limited the pool of potential applicants. The Programme Manager/In-School Coordinators were advised to prioritise preparation of grant application if they had limited capacity. |
| Bursaries worth £15,000 (paid over three years) awarded each year to women from low-income households studying engineering at degree level | 7 currentlyInitial call saw 3 students apply, be interviewed, and awarded bursaries. Direction from DfE was to endeavour to award all 8 bursaries which led to amended eligibility and a second call promoted through the existing awardees, participating schools, EA & STEM NI. 4 students received the bursary in the second call with funding for the final Bursary absorbed back into the Programme. |
| One network meeting per term to encourage collaboration and share best-practice | Schools all onboarding at different times made this challenging. All teachers invited to the celebration day. Contact made directly between teacher co-ordinators where appropriate.  |
| CPD for primary and post-primary school teachers on Academy STEM resources, released twice per year | Future of Flight released in February. Training provided at the same time. Water resource released in March – training to be delivered once all schools are recruited plus release of digital water resource. |

1. This could include a low-income scholarship or bursary from your university either paid to you or towards your accommodation, a fee waiver, a hardship grant, a nonrepayable maintenance grant, a means-tested maintenance loan from Student Finance NI, as long as the criteria on which these awards were made was low income or hardship. [↑](#footnote-ref-2)
2. [https://bursary.borntoengineer.com/resources/engineering-scholarship](https://www.borntoengineer.com/resources/engineering-scholarship) [↑](#footnote-ref-3)
3. *NIEEP Business Case, DfE* [↑](#footnote-ref-4)
4. RAEng & DfE Meeting 10th November 2022 [↑](#footnote-ref-5)
5. https://raeng.org.uk/media/4mcolr2x/03-applicant-guidance-notes\_relaunch2\_2223.pdf [↑](#footnote-ref-6)
6. *To clarify: not international/EU citizens without settled or pre-settled status.*  [↑](#footnote-ref-7)
7. [https://bursary.borntoengineer.com/resources/engineering-scholarship](https://www.borntoengineer.com/resources/engineering-scholarship) [↑](#footnote-ref-8)