

Swyddfa Cyllid Ewropeaidd Cymru
Welsh European Funding Office

STEM Gogledd

WEFO no: c80947

Business Plan

June 2016

Lead Beneficiary: Gwynedd Council

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Executive Summary

STEM Gogledd is applying for EU funding support from ESF Priority Axis 3: Youth Employment and Attainment, Specific Objective 3 to increase the take up and attainment in STEM subjects amongst 11-19 year olds in North West Wales, through a range of interventions that will compliment but not duplicate mainstream services.

Result Indicators

Indicator	Target
Young People 11-19 who continue to study a Maths, Science, Engineering and Technology post 16 – female	106
Young People 11-19 who continue to study a Maths, Science, Engineering and Technology post 16 – male	86
Young People 11-19 completing training in Maths, Science, Engineering and Technology subject post 16 – female	197
Young People 11-19 completing training in Maths, Science, Engineering and Technology subject post 16 – male	161

The **target beneficiaries** for this project are young people between 11-19 years old living in the North West Wales counties of Anglesey, Gwynedd, Conwy and Denbighshire. It is likely that the bulk of the work will be targeted towards the higher end of the age-range (14-19), but due to the transformational nature of the project, and its key message, we are keen to work with younger individuals to begin the process as early as possible.

Within the Operational Programme it states “As outlined in the Strategy, Welsh GCSE entries for STEM subjects have declined by 12% over recent years¹ with a corresponding decrease in attainment levels during the period 2008-2013” We have therefore based our target on this theory, The 2014/15 academic year across North West Wales had a total of 4,383 pupils aged 15, therefore the STEM Gogledd operation proposes to work with 12% of the cohort which would be 550 students, with a proportion of 55% Female and 45% Male.

Total Target	550
Female Participant	302
Male Participant	248

The target beneficiaries for this operation have been identified through a detailed assessment of North West Wales data. The information below, is based on our current data set, but can be subject to change if we receive a new data set for the latest academic year from our partners.

Target beneficiaries will be identified with the following 3 rationales (a full breakdown for the rationale can be found at *c. Further Strategic Criterion: Suitability of Investment: Need for the Operation: Target Participants*):

¹ The Welsh Government (2012) Science for Wales, A strategic agenda for science and innovation in Wales

1. Young people in education identified by the teachers/Heads that are at risk of achieving grades C/D in specified science subjects and will benefit from added value inspirational engagement activities to improve predicted grades.
2. Young people in education identified by the teachers and/or Careers Advisers that would benefit from additional STEM inspired activities to help them decide on choosing STEM options post 14, post 16 and/or post 17
3. Young people unable to access specific STEM related work experience.

Description of the operation (see **STEM Gogledd Preferred Option for Delivery** Section for full details)

To enrich and promote the core STEM subject curriculum offer within schools a, through a range of bespoke interventions that will compliment but not duplicate or replace mainstream services. Analysis of mainstream provision has been carried out with the full cooperation of the partners involved in delivery and support of other STEM projects. This project is bespoke in its nature following the STEM Audit findings, discussions and consultation with partners in the Project Development Group and will deliver a service where there is currently a gap in STEM provision regionally. The Project Development has ensured that there is no duplication of mainstream services.

STEM Gogledd will contribute to the Region's Growth Vision and Regional Skills and Employment Plan to develop a vibrant and responsive future workforce to meet the future skills demands of the region. The operation will aim to increase the take up and attainment in STEM subjects amongst 11-19 year olds in North West Wales, resulting in young people who continue to study STEM subjects post 16, and young people completing training in STEM subjects. In order to achieve this, the STEM Gogledd project will offer the following 3 main strands (bilingual), but they will be tailored to meet bespoke provision:

1. Coordination Function – appoint STEM coordinators for the region.
2. Virtual STEM Hub – a web based interactive STEM Hub.
3. STEM Mentors - Personalised support and information within STEM.

Management and Delivery

The project will be managed by Gwynedd Council. Joint beneficiaries are the 3 other North West Wales Local Authorities and we are currently in discussions with local employers.

The Lead Beneficiary and its partners all have substantial and extensive experience in the delivery of major projects, including those funded through the Structural Funds.

A STEM Gogledd Regional Team will be based in Gwynedd, and will be established to manage, coordinate and oversee the project in each of the Beneficiary areas. This small focused team will include a Project Manager, Finance Officer & Monitoring Officer.

The delivery of the project's services across the region will be undertaken by a regional delivery team. Full details of the delivery team are detailed in Management of Operation Section. The delivery team include the following:

- STEM Co-ordinator
- STEM Mentors

Key Barriers and Risks

The **key barriers** facing identified participants can be broken down as follows:

- Lack of awareness of labour market opportunities and STEM pathway opportunities.
- Lack of inspirational STEM activities.
- Lack of STEM Co-ordination.
- Availability of resources in Welsh language.

In order to manage the **risks** within this operation, a detailed risk register has been developed. The Risk Register will be reviewed and updated regularly. It has been based on the TRAC 11-24 Risk Management Plan and will address the following elements identified as being of highest risk (other risks have been scored and identified on the RAYG basis):

- Local Authority rationalisation – Capacity to deliver in the cuts agenda, increasing demands for organisations to rationalise budgets.
- Procurement timeline – potential of a low uptake of procurement opportunity.
- Quality of provision – poor quality provision and inconsistent delivery across the region.
- Engagement – lack of engagement or support for the operation.
- Safeguarding – Level of safeguarding process and protocols not adhered to. Potential risk for participants.
- Partnership working – difficulties managing a range of different services at a regional/national level. Could result in failure to achieve outputs.
- Communication ensure clear communication channels exist between Lead and Joint Sponsors, ensure clear communication channels exist between different stakeholders, this includes timely reporting to WEFO.
- Recruitment – Staffing issues.
- Outputs – failure to reach project outputs.
- Match Funding – unable to evidence sufficient match funding.
- Exit Strategy – project sustainability.

Financial Profile

- Three year project April 2017 – March 2020
- Total project cost £2,086,976.00
- ESF £1,460,883.00
- Total Match Funding £626,093.00

We are currently exploring potential match funding for the project. STEM Gogledd anticipates that match funding for STEM Gogledd will be from local employers along with the 4 Local Authorities, discussions are currently ongoing. Local Employers have been approached through a formal letter sent on November 21st 2016, follow up e-mails and phone calls are currently underway, with face-face meetings taking place to agree the match funding.

Cost Heading	Q1 2017/18	Q2 2017/18	Q3 2017/18	Q4 2017/18	Q1 2018/19	Q2 2018/19	Q3 2018/19	Q4 2018/19	Q1 2019/20	Q2 2019/20	Q3 2019/20	Q4 2019/20	TOTAL
	Apr-Jun 2017	Jul-Sept 2017	Oct-Dec 2017	Jan-Mar 2018	Apr-Jun 2018	Jul-Sept 2018	Oct-Dec 2018	Jan-Mar 2019	Apr-Jun 2019	Jul-Sept 2019	Oct-Dec 2019	Jan-Mar 2020	
Staff													
Project Manger	£12,037	£12,037	£12,037	£12,037	£12,157	£12,157	£12,157	£12,157	£12,279	£12,279	£12,279	£12,279	£145,887
Finance Officer	£8,172	£8,172	£8,172	£8,172	£8,254	£8,254	£8,254	£8,254	£8,336	£8,336	£8,336	£8,336	£99,048
Monitoring Officer	£8,172	£8,172	£8,172	£8,172	£8,254	£8,254	£8,254	£8,254	£8,336	£8,336	£8,336	£8,336	£99,048
STEM Co-ordinator (2 posts)	£21,437	£21,437	£21,437	£21,437	£21,652	£21,652	£21,652	£21,652	£21,868	£21,868	£21,868	£21,868	£259,826
STEM Mentor (6 posts)	£59,573	£59,573	£59,573	£59,573	£60,168	£60,168	£60,168	£60,168	£60,770	£60,770	£60,770	£60,770	£722,040
STAFF TOTAL	109390	109390	109390	109390	110483.8	110483.8	110483.8	110483.8	111588.5	111588.5	111588.5	111588.5	1325849
Simplified Costs													
Simplified Costs (@15%)	16409	16409	16409	16409	16573	16573	16573	16573	16738	16738	16738	16738	198877
SIMPLIFIED COSTS TOTAL	16409	16409	16409	16409	16573	16573	16573	16573	16738	16738	16738	16738	198877
Administration													
Administration	1000	750	750	750	750	750	750	750	750	750	750	750	9250
ADMINISTRATION TOTAL	1000	750	750	750	750	750	750	750	750	750	750	750	9250
Human Resources													
Recruitment	3000												3000
Redundancy												40000	40000
HUMAN RESOURCES TOTAL	3000	0	0	0	0	0	0	0	0	0	0	40000	43000
ICT													
Hardware Purchase	10000												10000
Software	50000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000		100000
ICT TOTAL	60000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	0	110000
Marketing & Promotion													
Advertising & promotion	16000		8000				8000			8000			40000
Events				50000				50000					100000
Exhibitions and Conferences													0
Printing, Production & Reprographics													0
MARKETING AND PROMOTION TOTAL	16000	0	8000	50000	0	0	8000	50000	0	8000			140000
Travel & Transport													
Subsistence													
Travel & Transport Other	2000	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600	2000	60000
TRAVEL AND TRANSPORT TOTAL	2000	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600	2000	60000
TRAINING													
Training Courses		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	100000
Training Materials													
TRAINING TOTAL	0	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	0	100000
Professional Service													
Accountancy & Audit				5000							5000		10000
Evaluation, development & Monitoring	30000			30000							30000		90000
PROFESSIONAL SERVICE TOTAL	30000	0	0	35000	0	0	0	0	0	35000			100000
TOTAL	237799	147149	155149	232149	148406	148406	156406	198406	149677	192677	149677	171077	2086976
ESF TOTAL (@70%)	166459	103004	108604	162504	103884	103884	109484	138884	104774	134874	104774	119754	1460883
MATCH FUNDING REQUIRED (@30%)	71340	44145	46545	69645	44522	44522	46922	59522	44903	57803	44903	51323	626093
Match (@20%)	71340	44145	46545	69645	44522	44522	46922	59522	44903	57803	44903	51323	626093
Simplified Costs	16409	16409	16409	16409	16573	16573	16573	16573	16738	16738	16738	16738	198877
Employers match Funding	54931	27736	30136	53236	27949	27949	30349	42949	28165	41065	28165	34585	427216

Section 1

a. Core Criterion: Strategic Fit

Specific Objective 3

The aims of the ESF Operational Programme for West Wales and The Valleys, 2014-2020 align closely with that of this operation. STEM Gogledd will address the aim of ESF Priority Axis 3: Youth Employment and Attainment. Further it will address Specific Objective 3 to increase the take up and attainment in STEM subjects amongst 11-19 year olds in North West Wales, through a range of interventions that will complement but not duplicate mainstream services.

Wider Investment Context

Economic Prioritisation Framework²

STEM Gogledd has been developed in line with the key principles of the Economic Prioritisation Framework, and is aimed at helping to support economic growth in North West Wales. The operation is aligned closely with the guiding principles of West Wales and Valleys ESF Programme, Priority Axis 3: Youth Employment and Attainment, Specific Objective 3: To increase the take up and attainment in STEM subjects amongst 11-19 year olds in North West Wales, contributing towards maximising the impact of EU funding in the context of the wider investments being made in the North Wales economy predicted to drive sustainable economic growth and jobs in the region.

The operation also seeks to help address a key challenge for skills and employment in the North Wales region, as reported in NWEAB Region Skills and Employment Plan (2016), by contributing towards *'increasing the uptake and promotion of STEM related subjects and skills aligned to employer demands'*. The Plan which is endorsed by Welsh Government, has identified a suite of demands in terms of STEM skills and employment that will be needed to meet the needs of a growing North Wales economy, particularly in the three key economic sectors, Energy and Environment, Advanced Manufacturing and Materials and Construction, as well as in the four growth sectors, Creative Digital, Health and Social Care, Tourism and Hospitality and Food and Drink Manufacturing.

The operation will continue to work closely with the NWEAB Skills and Employment Group – the Regional Skills Partnership to ensure that it is aligned with the Regional Skills and Employment Plan and adds bespoke and appropriate value to the regional economic opportunities and the labour market demand and supply needs identified for North Wales. STEM Gogledd will also follow developments in the other NWEAB Work Streams e.g. in relation to supply chains and infrastructure so that any potential benefits can be realised.

The NWEAB has established an ESF Project Leads group which will feed directly into the NWEAB Regional Skills & Employment Group as the official WG Regional Skills Partnerships body for North Wales. With the high current level of numbers of attendees, and limited discussion time available within the NWEAB Regional Skills Group, it has been agreed with

² <http://gov.wales/docs/wefo/publications/150615theeconomicprioritisationframeworkv3.pdf>

support of the NWEAB and WG, that a dedicated ESF projects group that will allow full discussion and transparency on issues, areas of collaboration, and potential sharing of further intelligence to support client delivery. The aim is that this specific group of all dedicated Regional ESF Project Leads will initially meet monthly as projects look to complete business plans / commence operations etc., to provide a transparent and open discussion forum to share challenges, ideas, and additional intelligence as individual projects that collectively form a suite of regional skills based projects for North Wales.

Unlike other similar national projects, STEM Gogledd will actively engage and work with stakeholders from the NWEAB which include Economic Development Partnerships, Employer Forums from across North Wales to; identify regional opportunities that align to wider ESF operations to these investment actions; ensure added value to the regional skills agenda; and support ERDF Investments. Working alongside any regional ERDF developments to exploit any opportunities which may be available for young people; with the operation aiming to work with participants with a broad STEM skill set (entry level qualifications through to graduates) it could effectively supply any skills requirements. This also supports the Regional Skills and Employment Plan which identifies the need for *“Better coordinated preparation required to meet skills needs of projected growth sectors”*

In doing so, this regional specific operation will look to work alongside other national operations delivering in some areas of North Wales as STEM Cymru and Technocamps; along with any other operations delivering in the region; thus ensuring there is a parity of offer across the region based on the identified needs. This will be achieved through the county level panels and continued close working relationships with the partners already firmly established. There is good potential and an appetite to pursue cross referrals between other national STEM projects once the identification of needs has been established in order to fully meet participants needs, provided added value and achieve good outcomes.

Additional opportunities will also be extended beyond the region with North Wales being advantageously placed to the Northern Power House. With the development of infrastructure in the North which will bring significant advantages to the region, it will be important for the operation to ensure that this additional value is taken into account. The EPF identifies that this will be especially significant with key employment opportunities such as advanced manufacturing and the energy sector; especially with estimations that North Wales is to benefit from over 40,000 new jobs being created and many of these jobs will require skills that are aligned to subjects such as medicine, engineering and technology, computer science, creative, arts and design and the physical sciences; this creation of new roles will see a greater need to ensure that young people remain in the region as opposed to the high outward migration levels it currently experiences and similarly look to fill the gap and in effect ‘back fill’ roles and opportunities which may also be created in the supply chains; greater emphasis is required for strong succession planning within the region.

Other growth sectors which the operation will look to support as identified in the EPF, include the Creative Digital, Health and Social Care, Tourism and Hospitality and Food and Drink Manufacturing.

STEM Gogledd has the clear potential of contributing directly to all thematic economic opportunities in the EPF in terms of the support the operation will provide in ‘enhancing participation in STEM subject amongst young people, particularly young girls’ and in supporting ‘the development of a future skilled, agile and resilient workforce’ in North West Wales. There does appear to be a clear correlation between many of the key demand drivers identified under these opportunities and in existing capability in terms of employment opportunities for young people with the appropriate STEM skills, especially in for example in the Energy (Anglesey Energy Island developments); Food and Farming (Food and drink manufacture); Climate Change and Resource Efficiency (investment in the Anglesey and Snowdonia Enterprise Zones and the Centre for Alternative Technology); Exploitation of ICT Assets and Opportunities of the Digital Marketplace (North Wales Creative industry developments); Advanced Manufacturing (Snowdonia Enterprise Zone – Llanbedr Aviation and Centre and Enterprise Park) thematic opportunities.

Although there are considerable economic opportunities located on the A55 corridor, the operation will also need to ensure clear links to any developments which result from the Rural Development Programme, which is significant in the four North West Wales counties.

In addition to those sectors mentioned above, the Construction Sector is also a regionally significant industry but there are increasing concerns regarding the ageing workforce population in North Wales given the potential investment economic opportunities which are due to start in the area. Current forecasts predict that 50,000 skilled employees, including quantity surveyors, chartered engineers and architects, are due to retire from the industry across the UK over the next 12 months which could create a large vacuum that will not be easy to fill unless action is taken.

The operation will be clear in its delivery to actively look to encourage and prioritise support the use of the Welsh Language in the working environment which aligns with the Welsh Language Strategy which identifies the need “*to increase the provision of Welsh-medium activities for children and young people and to increase their awareness of the value of the language*” and also identifies that between 1,200 and 2,200 fluent Welsh speakers are currently being lost from Wales each year.

The fundamental aim of STEM Gogledd is to work with 550 young people in 33 secondary schools in North West Wales, and develop regionally focused innovative non-core actions /solutions and STEM skills that will stimulate and motivate more young people to pursue STEM careers which are linked to opportunities identified in the North Wales Skills and Employment Plan and based on current and future employer demands. It is envisaged that the operation will also contribute towards improving the prospects of young people in North West Wales and help them to secure high value sustainable employment opportunities in their local areas, helping to restrict the flow of talented young people out of the region. These regionally developed and delivered innovative non-core actions /solutions and STEM skills supported through STEM Gogledd are aimed at enriching, promoting and adding value to the core STEM curricular subjects that are currently on offer in the schools and colleges and not duplicating provision.

Other Government Policies

The STEM Gogledd operation will support a suite of wider government policies including:

Policy statement on skills³ - The overall purpose of this statement is to provide the long-term and strategic view of how the skills system in Wales will need to evolve. The statement covers four priority areas for the Welsh Government:

1. Skills for jobs and growth – This focuses on how Wales can stimulate demand for a more highly skilled society that can drive forward our economy in the pursuit of jobs and growth.
2. Skills that respond to local needs - Describes how Wales must develop a skills system which reflects the needs of local communities, including providing a streamlined and accessible employment and skills offer for both individuals and employers.
3. Skills that employers’ value - Recognises the importance of engaging employers to participate in the skills system and describes the level of co-investment needed alongside government if Wales is to remain competitive.
4. Skills for employment - Explores the role of the skills system in providing the employment support necessary to assist individuals into employment and to progress in work, both of which are central to our tackling poverty agenda in Wales.

Welsh Medium Education Strategy⁴ - This strategy outlines steps for the development of Welsh-medium and Welsh language education. The strategy recognises the need to embed processes for planning Welsh-medium provision; the need for improved workforce planning and support for practitioners; the need to ensure that our young people are confident to use their Welsh language skills in all walks of life.

National Assembly for Wales – Science, Technology, Engineering and Mathematics Skills⁵ - This follow-up inquiry by the National Assembly for Wales called for ‘a more strategic and joined-up approach to intervention in the different STEM subjects, based on a greater understanding and evaluation of their impact.’

It recognised the scale of the challenge across education settings and society to bring about the cultural change necessary for positive, gender-neutral perceptions of STEM. The inquiry also noted that, “Wales needs to strive for excellence in STEM right through the pipeline – from the curriculum and qualifications offered in primary and secondary schools, in colleges and universities, through careers advice and work experience, and into meaningful and sustainable employment.”

The EBC called for a coherent plan for the promotion, monitoring and evaluation of STEM enrichment activity through the National Science Academy (NSA), and across the Welsh Government.

³ <http://gov.wales/docs/dcells/publications/140129-policy-statement-on-skills-en.pdf>

⁴ <http://wales.gov.uk/topics/educationandskills/publications/guidance/welshmededstrat/?lang=en>

⁵ <http://www.senedd.assembly.wales/documents/s31151/Report%20-%20September%202014.pdf>

“The EBC’s report highlights high levels of STEM education and training activity, but notes that progress in STEM skills attainment has remained too slow.”

The inquiry presents 14 recommendations, with some in particular relevant to STEM Gogledd project development.

- Recommendation 4. Encourage schools to play a more active role in replacing the services previously carried out by Careers Wales, and support them in liaising with employers and organising relevant, timely and meaningful STEM placements for young people.
- Recommendation 6. Target interventions from year 7 onwards, so that students receive accurate and impartial careers advice before they have to make crucial subject choices, and ensure that advice is provided in person as well as online through a significantly improved Careers Wales website. STEM Gogledd propose to develop an online resource, the STEM Hub will offer participants access to a “one stop shop” of all the STEM provision information in North West Wales including sign posting facility with links to other providers’ resources including Careers Wales. .
- Recommendation 14. Address the lack of availability of STEM teaching materials in the medium of Welsh.

The STEM agenda is therefore vitally important for Wales, and will become even more so in future, with the increase in demand of STEM employment opportunities. This requires a more strategic and joined-up approach to interventions in the different STEM subjects, based on a greater understanding and evaluation of their impact. Interventions in getting young people interested in STEM, girls especially, and in influencing the key influencers—parents and teachers—need to start as early as possible.

It identifies the need to see changes in the STEM curriculum to focus on the qualification needs of the young person in their chosen career or learning pathway, not what might be convenient or desirable for the school.

Delivering Science for Wales 2015-16: Annual Report on our Strategy for Science in Wales⁶

- “The ‘Women in Science’ group’s report Talented Women for a Successful Wales was published on International Women’s Day – 8 March 2016. It seeks to make practical recommendations to reduce the barriers at all levels from education to recruitment, retention and promotion, including: **Stronger links around STEM**, between schools, colleges and the business community.” (PAGE 3) “There are, fortunately, **many useful initiatives** to increase the numbers of **girls taking certain STEM-related subjects** but there has been a **lack of longitudinal tracking to determine their impact.**” (PAGE 17)

Talented Women for a Successful Wales a report on the education; recruitment; retention and promotion of women in STEM-related study and careers⁷ - This report makes

⁶ <http://www.lsrnw.ac.uk/files/2016/06/160331-science-for-wales-report-2016-en.pdf>
<http://gov.wales/topics/science-and-technology/science/?lang=en>

⁷

https://www.academia.edu/23616040/Talented_Women_for_a_Successful_Wales_a_report_on_the_education_recruitment_retention_and_promotion_of_women_in_STEM-related_study_and_careers

recommendations to address the under-representation and poor retention of women in STEM in Wales, based on four major themes – education, recruitment, retention and promotion. The under-representation of women in the STEM workforce is a critical issue for Wales. Addressing the factors which affect women’s decisions to enter, remain or return to STEM education and careers will have a profound effect on the talent available to business and the research community in Wales and by extension the well-being and prosperity of our society. Children start to formulate ideas about gender from a very early age and those ideas can become relatively fixed by the ages of 10-14. The National Assembly for Wales Enterprise and Business Committee called for ‘a more strategic and joined-up approach to interventions in the different STEM subjects’ and pointed out that ‘getting young people interested in STEM, especially ... need[s] to start as early as possible.’ Better links between industry and schools would be beneficial, as would allowing children access to broad range of female role models in STEM careers, at all levels. Careers education and information provided within the school or college environment needs to be improved and provided without gender bias to allow children to explore the wealth of STEM opportunities open to them. All children need to be exposed to what is fascinating and rewarding about STEM in the world around them.

Science, Technology, Engineering and Mathematics (STEM) in education and training⁸ - The recent Welsh Government publication ‘Science, Technology, Engineering and Mathematics (STEM) in education and training – A delivery plan for Wales’, has a clear strategic vision that places the development of STEM skills and knowledge at the heart of their education improvement plan, as well as a bedrock for innovation in business and industry and is essential to the development of a prosperous and sustainable knowledge economy. The timely publication of this delivery plan for Wales has called for a revised direction of the original STEM Gogledd proposal, in order to align closer to, and complement the national strategic policy direction. Thus, responding to, and beginning to address some of the main local and national challenges.

Review of Qualifications for 14-19 year olds in Wales⁹ - The Review of Qualifications for 14-19 year olds in Wales sets out the vision of ‘qualifications that are understood and valued and meet the needs of our young people and the Welsh economy’. The review sets out the findings and has 42 recommendations to the Welsh Government. Recommendation 17 states that “Providers should engage more effectively with partners such as employers to deliver qualifications within and elements of the Welsh Baccalaureate including work experience, work-related education, skills-based or enterprise elements. The Welsh Government should support such collaboration.”

Careers and the world of work: a framework for 11 to 19-year-olds in Wales¹⁰ - STEM Gogledd will add value to the Careers and World of Work: a framework for 11-19 year olds in Wales by promoting STEM learning experiences across the curriculum. This curriculum does not have specific requirements for schools in terms of contact with and experience of employer engagement. The learning outcomes can be achieved from hypothetical and simulated experiences, research, data analysis, narrative analysis and presentations. STEM

⁸ <http://gov.wales/docs/dcells/publications/160311-stem-delivery-plan-en-v2.pdf>

⁹ <http://gov.wales/docs/dcells/publications/121127reviewofqualificationsen.pdf>

¹⁰ [https://www.careerswales.com/prof/upload/pdf/Careers_Wow_WEB_\(E\).pdf](https://www.careerswales.com/prof/upload/pdf/Careers_Wow_WEB_(E).pdf)

Gogledd will provide the opportunity for schools to achieve a tangible relationship between employers, STEM subjects and the Careers and World of Work framework based on clear regional demand and opportunity. There is potential added value benefit to be achieved via STEM Gogledd from the expectation to enhance awareness of learner's 'Attitudes and Values (11-19)' underlying the preparation for the world of work.

Whilst the Careers and World of Work Framework is a compulsory for all schools the interpretation of the detail within the framework can vary greatly from school to school. For example there is no compulsory and statutory requirement to ensure that real work experience outside the school takes place. This has resulted in a wide range of practices across the region relating to real work experiences that pupils are exposed to.

Welsh Baccaulaureate¹¹ - The Welsh Baccaulaureate is undertaken by all secondary schools in the region of the operation and includes the opportunity for pupils to undertake an 'Enterprise and Employability Challenge' option. This is optional and not prescriptive. STEM Cymru will offer to facilitate this as part of the Menu of Services and offer to coordinate STEM activities with partners such as GwE, the regional Education Consortium to add value to STEM related activities as part of the Welsh Baccaulaureate. STEM Gogledd can add value to the Welsh Bac. By linking schools within the region with STEM related employers who have a real opportunity to develop learner's skills and attributes to enhance their generic and transferrable employability skills whilst at the same time enhancing their awareness of STEM employers and achieving the outcomes of the qualification. The relationship formed between the school and employers can then be sustained and extended for various other projects and careers and world of work focussed activities, based on regional need and demand, and facilitated by a project with genuine regional and local understanding of key and associated drivers.

Skills implementation Plan Delivering the policy statement on skills¹² - This skills implementation plan has been developed to inform future action in relation to post-19 skills and employment policy. The plan follows from the policy statement on skills published by the Welsh Government in January 2014. The aim of the plan is to provide details of the actions to be undertaken by the Welsh Government working with employers, individuals, trade unions and delivery partners.

As presented within the policy statement on skills, our ambition remains to develop a skills system in Wales that supports our future competitiveness, helps us evolve into a highly skilled society as well as tackle poverty, and is sustainable against the backdrop of ever scarcer resources. Our primary focus will continue to be on raising productivity, reducing barriers into work and supporting people into sustainable employment. The actions described will set the foundation for developing a sustainable skills system in Wales capable of responding to an increasingly global market for skills, and prepare the ground for conditions beyond the next round of European funding. Building on our policy statement on skills our long-term outlook for the skills system in Wales focuses on: Skills for jobs and growth focusing on higher levels of skills development across the workforce, ensuring that vocational routes are valued and supporting employers to work collectively in responding to

¹¹ <http://www.wjec.co.uk/qualifications/welsh-baccaulaureate/welsh-bacc-from-2015/ks4-national-foundation/>

¹² <http://gov.wales/docs/dcells/publications/140714-skills-implementation-plan-en.pdf>

their skills needs. Skills that respond to local needs Providing an integrated, streamlined and accessible skills and employment offer for individuals and employers and devolving responsibility to delivery partners to develop flexible responses based upon the needs within local communities. Skills that employers value Working with employers to develop adult vocational qualifications and apprenticeship frameworks and supporting them to fully utilise the skills of their workforce through developing a culture of high performance working and investment in skills alongside government. Skills for employment Supporting individuals to enter employment through access to skills information and work experience opportunities and aspiring that all working adults have a minimum level of literacy, numeracy and ICT skills to support their career progression.

WISERD¹³ - WISERDEducation is a £1m project following 1,200 pupils aged 5-17 years as they progress through their education. It is designed to strengthen educational research in Wales, funded by the Higher Education Funding Council for Wales (HEFCW). During April and July 2014 WISERD surveyed 3 cohorts, Year 7, Year 9 and Year 11 students. The Year 11 findings concluded that “pupils reported that teachers were the most influential group when it came to influencing their thoughts about careers and further education”, this was compared to Careers Teachers, Carers Wales, Employment Agencies, Teacher, Friends and Siblings.

Minister Statement “New national network of excellence for science and technology to be established”¹⁴ – Education Secretary Kirsty Williams announced on January 7th that more than £4M will be invested to establish a new network that will target the improvement of teachers’ skills in science and technology and improve pupils’ experience of the subjects while they are at school. This will involve schools working with the science and technology departments of universities, education consortia, further education and other experts. “The new Science and Technology network of excellence will:

- Draw together cutting edge knowledge for teaching practice in science and technology for 3 to 18 year olds.
- Co-ordinate the development and delivery of recognized science and technology professional development for teachers, based on global and local evidence of what works.
- Improve pupils' experiences of science and technology in schools across Wales.
- Enable schools to work together to develop courses, teaching resources and class-based research.”

UK Policies

The Royal Society: Increasing the Science Pool¹⁵ - This report considers the ‘pool’ of the UK’s 16-19 year old students taking mainstream science and mathematics combinations suitable for entry to higher education. The Royal Society has identified the role science plays in the UK’s economic growth. Businesses are appealing for more employees with better science, technology, engineering and maths skills. With insufficient numbers of STEM graduates for

¹³ <http://wiserd.ac.uk/wiserd-education/en/about-project/key-findings/links/>

¹⁴ <http://gov.wales/newsroom/educationandskills/2017/new-national-network-of-excellence-for-science-and-technology-to-be-established/?lang=en>

¹⁵ https://royalsociety.org/~media/Royal_Society_Content/education/policy/state-of-nation/2011_02_15-SR4-Summary.pdf

the needs of higher education and employment. In order to address these issues identifies The Royal Society notes the following should be addressed:

1. The size of the 'pool' in terms of the number and the proportion of 16-19 year olds studying mainstream science and mathematics qualifications needs to increase in England, Wales and Northern Ireland.
2. The careers information, advice and guidance available to this 'pool' of 16-19 year olds must enable them to make subject choices that will allow smooth transfer to STEM higher education courses.

Vision for Science and Mathematics Education¹⁶ - Included in this report is the vision for Science and Mathematics by 2030, and includes a 20 year plan. The vision highlights the need to link people's learning and skills to current and future needs of the economy. The vision recognises the importance for students to understand the significance of STEM through better careers awareness and guidance. With a recommendation for careers information, advice and guidance to be an essential part of the school/college week from early secondary school; along with a need to increase parents' understanding of how STEM offers many and varied employment opportunities for all children. The vision notes, if schools are to offer excellent careers advice and work experience they need to have a stronger relationship with employers. Work experience should be planned and delivered with the school's local context as well as the labour market in mind. The report refers to the importance and growth of social media for teenagers, and is suggested as a new and innovative informal means of delivering careers advice. **Growth Through People**¹⁷ - Included within the priorities for action in this document is that "education and employers should be better connected".

The level of engagement between education and businesses needs to increase. Exposure to the world of work should be central to every young person's educational experience. Combined with robust and accessible labour market information, this is the backbone of a high quality careers offer for young people. "Experience of work and good quality careers information have a vital role in preparing young people for work and tackling occupational segregation. Schools must play their role in challenging the gender stereotypes, working with employers and union learning reps to do so." Gail Cartmail, Assistant General Secretary, Unite the Union.

In order to better connect education and employers, the following is required:

- In order to create new pathways into work we need to start much earlier. All schools should have links with local businesses and use those links to inform and inspire young people about the breadth of career opportunities available. This includes access to labour market information, work experience and employer engagement. Further education colleges should be supported to work with employers to deliver higher level technical and professional education to meet the UK's technical skills gaps.

¹⁶ <https://royalsociety.org/~media/education/policy/vision/reports/vision-full-report-20140625.pdf>

¹⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/378810/14.11.26_GTP_V18.3_FINAL_FOR_WEB.pdf

Closer collaboration between employers, colleges and universities is essential to ensure there are seamless opportunities to work and learn over the course of longer working careers.

Making it all add up, Business priorities for numeracy and maths, CBI¹⁸ - This study highlights that at present not enough Young people leave school and college with the numeracy and maths skills they need for work and life. The study refers that the UK needs to do more to improve this, including: "All Young people should leave formal education with the confidence and ability to use and apply numeracy and maths skills in the workplace or in their further study; More Young people must be encouraged to continue their numeracy and maths education post-16 to support the UK's need for highly numerate technicians and employees with high-level science, technology Engineering and maths (STEM) skills". In order to achieve these outcomes, recommendations include "ensure all Young people continue with numeracy and maths in post-16 education and training; business must play its role to promote the importance of numeracy and maths."

Why your business should go back to school: How you can inspire the next STEM generation, Project Enthuse¹⁹ - This document provides guidance for businesses and organisations looking to provide support and inspiration for science, technology, engineering and maths in schools. The guidance has been developed following consultation with teachers. The aim is to showcase the opportunities offered by studying STEM subjects to Young people, and encourage them to continue with science and maths post-16. "Research shows that we can do this by helping more businesses to bring real-world context and inspiration into the classroom in a way that has genuine impact. We know that contextualising learning and widening the horizons of students by including examples of how STEM knowledge and skills are used in society and the workplace have a positive effect on engagement and attainment." The guidance suggests that businesses should provide real industry role models at all levels to give young people insights into STEM-related jobs.

Careers education: International literature review, (July 2016)²⁰ – This report provides an overview of the evidence-base underpinning careers education and its impact on pupils' skills and outcomes. This report highlights that mentoring can lead to better and positive outcomes within education.

Regional & Local Strategies

NWEAB Regional Skills and Employment Plan²¹ - The Skills and Employment Plan has been developed by the North Wales Skills and Employment Steering Group, which is a subgroup of the North Wales Economic Ambition Board. This group has now been recognised by Welsh Government as the official Regional Skills Partnership for North Wales, and has received Ministerial endorsement of the Plan as it provides an assessment of current skills and labour issues facing North Wales. The Regional Skills Plan also clearly identifies present and future

¹⁸ www.cbi.org.uk

¹⁹ <https://www.stem.org.uk/elibrary/resource/169379/project-enthuse-why-your-business-should-go-back-school-how-you-can-inspire>

²⁰ https://educationendowmentfoundation.org.uk/public/files/Publications/Careers_review.pdf

²¹ http://issuu.com/nweab/docs/skills_plan_final_web_file

demands within the region for skills and labour, and outlines the regional interventions required to address these.

The long term aim of the plan is that the region will have a competitive labour market, with a supply of high level skills, particularly in key growth sectors. To have excellent skills levels at all ages, and a demand-led education system reflecting the priorities of employers in the region's education curriculum. This will enable the labour market to have the skills and qualifications to access jobs as they rise.

The priority sectors identified as part of the Plan is Energy & Environment, Advanced Materials & Manufacturing and Construction, as well as the following growth sectors Creative & Digital, Health & Social Care, Tourism & Hospitality and Food & Drink Manufacturing.

One of the risks identified is for the labour market in North Wales, with the combination of an aging population, lack of succession planning by employers, inward migration of retirees, and the challenges around the retention of young people on completion of their studies.

The plan identifies the need to support closer ties between employers and our education providers, to address the potential risk that the region does not have the appropriate skills for the potential employment opportunities.

With cuts to Careers Wales within the region, the opportunity for work experience and placements for pupils have been significantly affected, as a result there is no longer a consistency of approach to support both young people and employers. In light of the forecast growth of the economy work is needed across education providers to support greater links with employers. Specific targeting within schools at an earlier age is needed, and addressing the deficit in careers guidance and work experience for schools across the region.

Challenges have been identified for each of the priority sectors:

- Energy & Environment – need to expand education and skills provision regionally to stimulate and inspire future career pathways in the sector as a response to an aging current workforce, and a need for greater technical STEM related skills to meet employer and technological demands.
- Advanced Materials & Manufacturing – raise awareness amongst young people, particularly females, of the opportunities that exist within the sector. This will help change perceptions of the industry and address future skills gaps.

One additional challenge identified is for the region to promote the increase in those studying STEM subjects to meet the needs of key sectors such as Energy, Manufacturing and Construction in addition to the STEM competencies increasingly required in our growth sectors such as Health and Social Care, Creative and Digital, Food & Drink, as well as growing elements of the Tourism Industry.

Previous research commissioned by the Regional Skills Plan within the NWEAB on STEM Activities across North Wales highlighted the lack of coordination and infrequency of

delivery often by national delivery agents or project who do not always possess direct regional economic awareness of future opportunities related to STEM. The research clearly articulates that, there is need for a coordinated approach to the promotion of additional employability skills expected within the workplace.

The plan recognises that the Welsh Language is a key asset and strength of the labour market in North Wales, and courses for those aged 16 and above delivered through the medium of Welsh to support the use of the language within the workplace should be further encouraged and developed.

Wylfa Newydd Project: Statement of Community Consultation²² - The Wylfa Newydd Project will bring significant investment and benefits to the economy of Anglesey and North Wales. An estimated 8,000 to 10,000 construction workers will be required during peak periods. This will include construction workers at the Power Station Site, Off-site Power Station Facilities and Associated Developments. The project will also create and support further employment and supply chain opportunities in support services and industries. Once the Power Station will be operational, it is anticipated that up to 850 permanent jobs will be created, and will include a range of roles.

A Single Integrated Plan for Anglesey and Gwynedd 2013-2017²³ - The Plan focuses on tackling many major complex and long term issues. The plan seeks to create a more prosperous and sustainable economy. This will be done by improving economic performance and skills to create/maintain jobs; ensuring that there are opportunities available for young people. The plan includes a list of principles including: to have a skilled workforce – by developing people’s skills so that they can make the most of the employment opportunities that may develop in the future.

- Economy – Improve the population’s skills in order to meet the opportunities of the future economy; support and encourage business opportunities and the growth of diverse employment; develop skills to meet the demands of employers. In achieving this aim is that people will have the education and essential skills to secure employment.
- Education – Foster a culture of high achievement and high aspiration in schools, colleges and training setting. By achieving this, the aim is that young people’s grades at GCSE level will improve.

Gwynedd

Gwynedd Council Strategic Plan 2013-2017²⁴ - STEM Gogledd directly addresses the; Priorities for the Children and Young People Theme: Raising the Educational Standards of Children and Young People, Better Preparing Young People for Living and Working Locally; and Priorities within the Economy Theme, Improving the strength and robustness of business and retaining the economic benefit in the local economy. Expected outcomes for the Children and Young People is theme is Percentage of pupils aged 16 who achieve the Level 2 Threshold (5 A* – C Grades) or equivalent

²² <http://consultation.horizonnuclearpower.com/>

²³ <https://www.gwynedd.llyw.cymru/en/Council/Documents---Council/Strategies-and-policies/Single-Integrated-Plan.pdf>

²⁴ <https://www.gwynedd.gov.uk/en/Council/Documents---Council/Strategies-and-policies/Gwynedd-Council-Strategic-Plan-2013-17.pdf>

Expected outcomes for the Economy theme are Number of high value jobs that have been created; Number of new jobs created with the support of the Council.

Strategaeth Ansawdd Addysg Gwynedd – The Gwynedd Education Quality Strategy is aimed at ensuring schools has the provision to equip children and young people to achieve the highest standard and nurture the qualifications and skills needed to live and flourish locally. The strategy noted that Key Stage 4 standards in Mathematics need improvement.

Anglesey

Anglesey Corporate Plan 2013-2017²⁵ - The aim of the plan is that by 2017 Anglesey Council will be a professional and well-run council, innovative and outward looking in their approach committed to developing their people and partnerships in order to deliver efficient and effective services of good quality. Within the Anglesey Corporate Plan there are priorities including Regenerating Communities and Developing the Economy; Improving Education, Skills and Modernising Schools.

The economy is a significant issue for many with new job creation seen as critical to provide a sound base for improving quality of life. The Energy Island Programme and recently designated Enterprise Zone status provides a once in a generation opportunity to create substantial new jobs as a result of the planned investment and growth potential of the low carbon energy sector. The Council will look at developing schemes which increase employment opportunities for young people, improve infrastructure and support the supply chain. This will hopefully result in an increase in employment opportunities, particularly within the low carbon energy sector, a reduction in youth out-migration.

The Council wants every child, young person, and learner, wherever they are and respective of background and circumstance, to achieve their full potential and play an active role as future responsible citizens and community champions. In this respect an accepted priority for the Council is to challenge current thinking, encourage innovation and develop a school infrastructure that will drive up standards of teaching and attainment, reduce surplus places, improve educational outcomes for children and young people and be responsive to our socio-economic and community improvement programme. The Council promise to continue to raise the standards in educational attainment, rates and attendance; adopt and deliver a regional skills strategy which enables Anglesey and North Wales to up-skill its workforce and align itself with future opportunities.

Energy Island Potential Opportunity and Economic Impact²⁶ - The Energy Island vision is to create a world-renowned centre of excellence for the production, demonstration and servicing of low carbon energy. In order to realise the Energy Island there is a need to focus on a limited number of opportunities that can deliver the right mix of ambition, impact and profile. These can play a significant role in a more resilient, diverse and prosperous economic future for Anglesey and North West Wales. The critical opportunity is the potential to deliver economic development and regeneration through the development of the low carbon economy, this means capturing jobs, engaging and linking individuals and communities to

²⁵ <http://www.anglesey.gov.uk/Journals/2014/04/02/u/s/p/corporate-plan-2013-2017.pdf>

²⁶ http://www.anglesey.gov.uk/Journals/public/attachments/126/Energy_Island_Exec_Summary_english.pdf

jobs through education and training and placing Wales as a leading location for energy research. Re-training and skilling the potential workforce for the new build and wider energy market should be supported to maximise the benefits for the local area in the immediate and longer-term future.

Denbigh

Denbighshire Corporate Plan 2012-17²⁷ - Among Denbighshire County Council's Priorities for 2012-17 are developing the local economy; improving performance in education and the quality of our school buildings. As part of developing the local community the council will work with local and regional partners to understand the skills demands from businesses in Denbighshire and in the wider market including in the Enterprise Zones at Deeside and Anglesey. We will ensure the delivery of a high class and relevant school curriculum and provide support to partners in creating demand and opportunities for training, apprenticeships, further and higher education. Through improving performance in education students will achieve their potential, the Council will support and challenge schools in order to raise standards and improve educational experiences for all, and ensure that the learning offer and opportunities presented enable all students in all phases of education to do the very best they can.

Economic & Community Ambition Strategy 2013 – 2023: Developing Opportunities, Creating Confidence²⁸

- Economic development has been highlighted as one of Denbighshire's top priorities in their corporate plan. The expectation that local economic growth can lead to improved outcomes for our residents is based on an economic Model that links business success with increased opportunities for work, leading to higher levels of income and increased spending power that in turn help to sustain vibrant towns and communities. Young people, particularly between 18 and 35 years old, tend to leave Denbighshire, often for employment or further/higher education. A thriving economy needs sufficient people of working age with the right skills for its labour market to function effectively. Access to work, suitable learning and training opportunities and affordable housing opportunities are key factors in attracting and retaining a younger working age population. Denbighshire is a high performing education authority and schools support young people to achieve good qualifications, however the small numbers of young people leaving school without a formal qualification has been identified as an area for improvement by the Council.

As part of Theme 4 in order to achieve a high quality workforce, support and challenge Careers Wales to improve the Careers advice available to young people in schools, improve the range, quality and availability of work experience opportunities. To develop advance skills for growth identify and promote career pathways in growth sectors, with particular focus on Manufacturing and Energy & Environmental Technologies, explore how to achieve better engagement with employers to understand skills needs/gaps, ensure the advanced skills needed for growth sectors are addressed effectively through school/college curriculum.

Conwy

²⁷ <https://www.denbighshire.gov.uk/en/your-council/strategies-plans-and-policies/corporate-strategies/corporate-plan-2012-17-en.pdf>

²⁸ <https://www.denbighshire.gov.uk/en/your-council/strategies-plans-and-policies/corporate-strategies/economic-and-community-ambition-strategy-en.pdf>

Conwy County Borough Corporate Plan 2012-17²⁹ - One outcome for the plan is that people in Conwy are educated and skilled. The aim is to improve local employment opportunities and reduce the outward migration of young people, improve skills for employment and improve educational attainment. This will be achieved by working in collaboration with partners to deliver the regional school improvement agenda to drive up standards for the attainment in Basic Skills and GCSE Core Subjects. As well as support the development of appropriate Science and Technology courses within schools to help young people gain skills and qualifications to improve their employment opportunities.

Grŵp Llandrillo Menai

Strategic Plan 2015-2018³⁰ - The Grŵp Llandrillo Menai Strategic Plan sets out how the organisation will be run during the period 2015-2018. GLIM are committed to inspire and motivate their students to succeed with opportunity employment and prosperity in the region. As part of the Plan, GLIM have set out their Strategic Goals:

- Achieve excellent student success – by increasing the proportion of students who progress to employment, apprenticeships or higher learning.

Support employer skills needs in a growing North Wales economy – by working with employers to identify skills and training requirements.

Careers Wales

The Careers Wales remit is to build capacity in schools and colleges with emphasis on targeting those in Careers Coordinator roles. There is evidence from regional learner voice surveys and increasing concern of the difficulty in providing up to date and relevant careers and labour market information to reach young people in schools who no longer have those traditional Careers Coordinator roles, partly due to changes in resources. The North Wales Economic Ambition Board Regional Skills and Employment Plan 2016 have alluded to this. <http://regionalskillsandemploymentplan2016.co.uk/>

STEM Gogledd will complement and add value to the Careers Wales offer in schools and enhance the value by offering the continued mentoring support to the young people and Careers Coordinators in schools who wish to engage in enhanced STEM provision. Careers Wales can incorporate the STEM Coordinator of this operation to provide regional labour market information and regional employer contacts linking to the growth and priority sectors of the region. Careers Wales are a valued partner fully involved in the STEM Gogledd Project Development Group and have provided a clear statement supporting STEM Gogledd's development and delivery in the region to complement Careers Wales core services.

Study into “STEM” Related Activities in Gwynedd and Mon³¹ - Dateb was commissioned by the Welsh Assembly Government to gather evidence on what is being done to promote and

²⁹ http://www.conwy.gov.uk/upload/public/attachments/593/conwy_cbc_corporate_plan_201217_summaryfinal.pdf

³⁰ <https://www.gllm.ac.uk/policies/>

³¹ Study into 'STEM' related activities in Gwynedd and Mon – Final Report, 10 March 2011

encourage the study of science, technology, engineering and maths (STEM) subjects among young people (aged 7 – 18) in Gwynedd and Môn and to identify any duplication or gaps in the nature of STEM engagement activities being undertaken. The key recommendation of the study were that no single organisation is resourced to coordinate STEM promotion and curriculum enhancement activities and contributors commented that things tend to happen in an uncoordinated and ‘ad-hoc’ fashion. A number of STEM related activities are designed to ‘enthuse’ youngsters about STEM in the abstract and do not necessarily seek to promote the study of STEM subjects at school or to promote a link between STEM related skills and attractive careers opportunities. A number of STEM related activities delivered locally are ‘one off’ events, which means that the messages transmitted are not necessarily reinforced. Over the years, a number of STEM promotion or curriculum enhancement programmes have only been available in English, which has made them inaccessible for some schools. Generally, it was thought that there is a wide range of STEM promotion or curriculum enhancement activities on offer across all Key Stages, but schools are not necessarily well placed to identify what best suits their needs.

Integration

ESF Structural Funds:

STEM Gogledd will work alongside other operations in place specifically those already in existence such as STEM Cymru and the soon to be developed Technocamps, along with other operations delivering in the region; thus ensuring there is a parity of offer across the region based on the identified need.

STEMCymru II – STEMCymru II is a well established operation delivered within the Convergence areas across Wales by the The Engineering Education Scheme Wales (EESW). STEMCymru II builds on the success for the STEMCymru project continuing to encourage young people to increase the take up of and attainment levels in STEM subjects. STEMCymru II delivers a range of exciting STEM engagements and activities linked to employers within the industry.

Gwynedd Council Officers who are leading on the STEM Gogledd operation have met with the STEMCymru II Manager on two occasions, in order to outline the operations, discuss any collaboration, ensure no duplication, but ensure that the operations can compliment each other. A STEMCymru II representative was invited to the STEM Gogledd Project Development Group meeting in order to introduce the operation, to ensure that all PDG members are fully aware when developing the STEM Gogledd operation. STEMCymru II has a representative on the STEM Gogledd Project Development Group which ensures regular updates between both operations.

STEM Gogledd and STEMCymru II have identified that both projects can compliment each other. As STEM Gogledd will have a direct link within schools through the STEM Mentor roles, this could be a means to refer eligible participants on to STEMCymru II via the STEM Hub. By this means both projects will add value to each other and promote collaboration.

Technocamps: Enhancing STEM Attainment – The Technocamps operation proposes to enhance STEM attainment, following on from the success of the Technocamps workshops

and master classes to increase the numbers of Welsh pupils studying Computer Science at higher level. The operation will be focused on prolonged engagement, with participants who have received substantial intervention from the project being encouraged through continued engagement to choose to study STEM subjects at post-16 level. Technocaps proposed to work with participant from schools that are not currently offering Computer Science as an option at GCSE, as well as those that have only recently started to offer it but find difficulty in recruiting and delivery.

A representative from Techniquet Glyndwr is part of the STEM Gogledd Project Development Group; the officer has had an active role in developing the business plan contributing towards workshop activities.

Other programmes:

Techniquet Glyndwr – The Centre is located at Glyndwr University, Wrexham. It is operated by North Wales Science, with the following principal objectives:

- To promote the advancement of education and learning, particularly amongst children, of science and technology and in particular (without limiting the generality of the foregoing) to do so by maintaining and carrying on an exhibition to explore various scientific concepts and to encourage an awareness amongst such children of the significance of science and technology in society;
- To promote public understanding of science and technology through the delivery of educational programmes, science festivals and other such activities as the company may deem necessary.

A representative from Techniquet Glyndwr is part of the STEM Gogledd Project Development Group; the officer has had an active role in developing the business plan contributing towards workshop activities.

A further mapping exercise has been undertaken, to map the proposed STEM Gogledd operation with other key STEM provision in North Wales.

There is no transnational activity planned within this operation.

Engagement to date

The planning of the project has been done directly and collaboratively across the region with key partners currently involved in delivering other STEM related core services and projects. The nature of the Project Development Group is based on transparency, consultation, direct involvement, influencing, suggesting and feedback. Consultations have taken place on a regional level, with all 4 local authorities (including Schools, 14-19 Networks, Education Department and Economic Development Teams), Grwp Llandrillo Menai, Coleg Cambria, Bangor University, Glyndwr University, Careers Wales, GWE and employers.

A consultation was undertaken with young people at the Skills Cymru event on 08/10/2016 at Venue Cymru, Llandudno. Over 30 young people participated in completing an online questionnaire, with equal participation by males and females. All who participated were at school with the majority either in Year 10 or 11. Pupils from across the region participated. 61% of participants noted that they are not aware of the STEM related employment opportunities available locally. Only 42% of participants noted that their schools offered

work experience placements with STEM employers. Question 15 consults on the type of opportunities young people would like offered within the future, in order to support this suite of opportunities we could conclude that a coordination role would be required across the region. This requirement would offer a service that is above and beyond what Careers Wales currently offer. The Coordination role would support to manage the relevance, timing and volume of information related to STEM and school subjects in order to be informed about future opportunities. The consultation and evidence suggests that there is a need for stronger and clearer links with the STEM curriculum subjects as part of the coordination function.

Engagement of Joint Beneficiaries

The development of the operation has been led by all 4 local authorities, the FE colleges, HE Colleges and Careers Wales in the region, and overseen by the North Wales Economic Ambition Board. Each of the beneficiaries involved in the project have also engaged and liaised with a range of partners in each local area.

Lead Beneficiary is Gwynedd Council. Joint beneficiaries are the 4 other local authorities.

Local Authorities

All local authorities meet the WEFO definition of a Joint Beneficiary. LAs have statutory responsibility for education provision for education up to 16. STEM Gogledd seeks to encourage the take up of STEM subjects. All LAs have been involved in the development of the operation. All are contributing to the management of the operation
The Operation has established a STEM Gogledd Project Development Group whose membership includes the following:

STEM Gogledd Project Development Group	
NAME	ORGANISATION
Iwan Thomas	Chair of the Group North Wales Economic Ambition Board
Ali Hunt	NSAN
Catrin Thomas	Gwynedd Council
Nia Medi Williams	Gwynedd Council
Christine Wynne	Conwy Council
John Gambles	Denbighshire Council
Aled Davies / Jayne Marr	Isle of Anglesey County Council
Dave Perkins	Bangor University
Scot Owen	Glyndwr University (Techniquet)
Catrin Williams	Grwp Llandrillo Menai
Rhian Lloyd Thomas	Careers Wales
Hayley Dunne	Chwarae Teg
Claire Burgess	Horizon
Elfed Morris	Consortiwm Addysg Ol-16 Gwynedd a Mon
Ian Connor / Paula Griffiths	Reaching Wider
Keith Jones	STEMnet
John Hughes	STEM Cymru

Peter Maddocks / Nicola Jones	GwE
Richard Harries	Welsh Government
Dyfrig Jones	Ysgol Tryfan, Gwynedd Education Department
Ffion Jones	North Wales Economic Ambition Board
Dylan Herbert	SP Energy Networks
Pryderi ap Rhisiart	M-Sparc
Jo Swanston	Siemens

The aim of the Project Development Group (PDG) has been to direct the development of the operation, making the best use of resources regionally for the benefit of the operation; ensure that beneficiaries adopt a teamwork approach and work collaboratively together towards the development of STEM Gogledd; ensure that it meets the needs of young people within the region, and achieves the expected benefits; take into account previous projects, models, consultations, lessons learnt, best practice and all other matters which will be pertinent for creating an operation which is fit for purpose, also ensuring that this information is shared amongst partners, for the benefit of project development and to take an operational role in the performance management of delivering the development of the project proposal to fruition.

STEM Gogledd Interactions Log

A detailed interactions log has been developed for the operation; this demonstrates the engagement to date.

Private Sector Displacement

There is no equivalent private sector provision for a coordinated STEM approach to enrich and promote the core STEM subject curriculum offer within schools, which links in with the partnership approach with local authority, schools and STEM providers.

The project activity included within the STEM Hub will be the result of the North West Wales STEM Audit to ensure that all opportunities and activities are available to participants.

b. Further Strategic Criterion: Cross Cutting Themes

In order to add value and raise awareness, the operation will look to adopt methods of best practice through the implementation and monitoring of Cross Cutting Themes, in particular those relating to; Equal opportunities and gender mainstreaming, Supporting the Welsh Language, Sustainable Development, Tackling Poverty and Social Exclusion.

Within North Wales public sector bodies are committed to the **Shared Equality Objectives: A collaborative working project between North Wales Public Sector organisations**³², which includes objectives to reduce unequal outcomes in; health, education and access to information.

As the lead organisation, Gwynedd Council has equality and diversity at the heart of the organisation's values.

³² <http://www.gwegogledd.cymru/about-us/about-gwe>

It will be the responsibility of the Regional Manager to consolidate and local managers deliver against CCT Objectives.

Each beneficiary has a robust equal opportunities policy in which the principles will feature throughout including management and delivery. This operation will be developed in line with the priority specific guidance on equal opportunities, along with the key guidance document (including an emphasis on bilingual provision).

STEM Gogledd will provide opportunities for all eligible participants irrespective of race, language, sex, sexual orientation, disability, age, religion or belief and will look to work with participants to overcome any barriers which may prevent them from engaging with STEM related subjects in schools and colleges .

The operation will look to develop effective ways to target, engage and encourage young people to follow STEM related subjects in schools and colleges. The operation proposes to work closely with GwEⁱ and 14-19 Coordinators, to approach schools who are currently underachieving in their A*-C grades at KS4 and post 16 and offer these schools a menu of STEM Gogledd services which will help them to add value to the National Curriculum subjects and lessons by reinforcing vocational relevance and key messages relating to STEM subjects beyond the curriculum and in their regional future and current employment context. This context will aim to provide further stimulus and inspiration to the teachers and the pupils to raise attainment and take up of STEM subjects in schools, at FE, HE and lifelong careers.

The role of the STEM Coordinators and the STEM Mentors will be key to the success of the operation. The information that is made available through partners in GwE, the 14-19 Coordinators, FE and HE, will help the STEM Coordinators and STEM Mentors to identify the participants that are most likely to need support from the project by for example: facilitating access to enhanced personalised STEM pathway information, guidance and support in their particular vocational, educational STEM choice; Raising awareness of local labour market demands and employment opportunities through employer engagement in the STEM skills related sectors, as well as, supporting participants through the key transition points during the academic cycle in relation to pathways progression to promote engagement and continuation with STEM, particularly at Post 16. There will also be considerable emphasis on interventions that will encourage more girls to follow STEM careers.

Each beneficiary has their own equal opportunity policy in which all activities and communications associated with the operation will abide by.

Participation on activities will be monitored through equal opportunities forms to gain information on participants' characteristics. This will be routinely monitored to ensure parity of offer and identify any groups who are not being adequately catered for. All recruitment undertaken as part of STEM Gogledd will be available to all, including those with protected characteristics as per the Equality Act 2010.

Equal Opportunities & Gender Mainstreaming

Gender segregation

We are aware that different approaches may be required to encourage engagement from male and female participants. STEM Gogledd will be offering targeted support for participants which will be based on need. A comparative offer irrespective of gender will be made available for all participants. Provision will look to align with sector specific areas such as engineering / construction and care, which are historically, associated with stereotypical gender roles.

Also during the mobilisation phase of the operation, induction events will take place with recruited staff to raise the awareness of gender equality.

As with all CCT's this will be monitored throughout the operation. The operation will monitor against achievement helping participants make STEM related career choices considered non-traditional –through monitoring the participant destination/outcomes and monitoring activity deemed as contributory to those sectors/roles. This will be captured through monitoring forms put in place as part of the operation e.g. exits form.

Black & Minority Ethnic

The operation will look to challenge stereotyping through the delivery and ensure equal access to all. If a participant has English as a second language which could include providing access to ESOL.

Disabled People/Work Limiting Health Conditions

The operation will look to deliver support and services to participants which remove barriers to them engaging with and participating with the operation or any activities delivered on behalf of the operations. E.g. physical barriers, provision of accessible materials and working with disability groups/organisations (when appropriate).

Supporting the Welsh Language

Language and Accessibility

Promoting the Welsh Language Commissioners' Policy Priorities³³ to create a future workforce which can serve a bilingual Wales; and also supporting the Welsh Language Policies which are present in all of the Joint Beneficiary and Lead Beneficiary Organisation Each beneficiary policy identifies the commitment to the Welsh Language, and the ability to recruit and interview in the medium of Welsh. Where appropriate within the region posts will be made Welsh essential or desirable depending on the communities which they serve (For example in Gwynedd, all posts will be Welsh essential).

³³ <http://www.comisiynydddygymraeg.cymru/English/Policy,%20research%20and%20data/Policy%20priorities/Pages/Education-and-skills.aspx>

STEM Gwynedd will also look to increase awareness of the benefits of the Welsh language for future employment opportunities and economic development.

The operation will ensure all materials, and publicity are aimed at the public are made available in accessible bilingual formats. E.g. Welsh/English.

Sustainable Development

Key economic drivers in North Wales are Energy & Environment, Advanced Manufacturing & Materials and Construction, as well as, the four growth sectors of Creative Digital, Health and Social Care, Tourism and Hospitality and Food & Drink Manufacturing using local and regional LMI to ensure participants are equipped to make informed decisions and develop appropriate STEM skills to career pathway development to achieve opportunities in key growth sectors e.g. providing targeted approach to participants in the low carbon sector with the opportunities to be informed of following on activity in either an academic or vocational environment.

All partner beneficiaries have a positive approach to positive environmental behaviour, and where possible this will be encouraged throughout the operation. For example to include; where possible activity will be located in areas to prevent unnecessary travel, recycling, saving energy & water, sharing transport and effective travel management.

In order to promote sustainable development, the operation will commit to producing:

- Travel Plan; which will promote sustainable transport initiatives available in the region; this will include car sharing, where appropriate.
- Eco code; which will promote resource efficiency measures and raising awareness of how this can be achieved.

Both documents will be made available on the operations webpage hosted on the lead's website for reference to stakeholders. All staff linked to the operation will be asked to read and to complete a signed acknowledgement of reading the documents.

Tackling Poverty and Social Exclusion

STEM Gogledd focusses on targeted support to remove barriers to encourage take up and raise attainment levels of STEM subjects in Schools which will in line with Welsh Government's ³⁴overall reforms contribute towards '*reducing the impact of poverty on educational attainment ... and equip young people to reach their potential and secure sustainable employment*'.

The STEM Gogledd operation proposes to work with participants in breaking down the identified key barriers relating to the lack of awareness of STEM related employment opportunities in the North West Wales labour market and appropriate STEM pathway requirements to achieve desired employment; by ensuring that activity STEM activity taking place in North West Wales is fit for purpose, and inspires young people to follow the

³⁴ <http://gov.wales/docs/dsilg/publications/socialjustice/120625tackpovplanen.pdf>

appropriate career path and gain the relevant STEM skills to meet both employer demands and their own expectations.

Stem Gogledd will provide support for the young people in schools and schools with low achievement levels in STEM subjects. Operation activity is aimed at adding value to the Curriculum subjects and lessons and drive up attainment.

Partners of the operation recognise concern of generational benefit culture and will work to prevent future generations experiencing poverty: to create progression opportunities and will help people to access those opportunities which will lead to sustainable employment. The operation will address key themes of the **Tackling Poverty Action Plan 2012-2016**³⁵ particularly the need to help people to improve their skills and enhance the relevance of their qualifications to lift people out of poverty. This will include:-

- creating of a new brokerage function that young people receive properly co-ordinated support through the STEM Coordinators and STEM Mentors;
- ensure that provision aimed at supporting young people is effective in providing the support they need;
- strengthen employability skills and opportunities for employment;
- focussed support on those individuals who face the greatest barriers; which will in turn impact on social mobility.

STEM Gogledd will contribute to the following goals of the Wellbeing of Future Generations Act³⁶:

- **A prosperous Wales** – Participants will be supported through the STEM Mentor and the STEM Hub to access career pathway information, as well as work experience opportunities and therefore contribute to the economy and prosperity of Wales.
- **A resilient Wales** – STEM Gogledd will support participants to overcome the barriers identified, improving the take up of and attainment in STEM Subjects.
- **A healthier Wales** – STEM Mentors will engage with participants and promote healthy lifestyles where appropriate.
- **A more equal Wales** – STEM Gogledd will offer provision to all eligible participants from all backgrounds.
- **A Wales of cohesive communities** – STEM Gogledd will offer provision within schools and the local community, and will promote local career pathways and opportunities.
- **A Wales of vibrant culture and thriving Welsh Language** – STEM Gogledd participants will be supported in their language of choice, with all activities and materials available bilingually.
- **A Globally responsive Wales** – STEM Gogledd will contribute towards a flourishing local economy, and will take into account any positive contribution on global well-being

³⁵ <http://gov.wales/docs/dsilg/publications/socialjustice/120625stackpovplanen.pdf>

³⁶ <http://gov.wales/docs/dsilg/publications/150623-guide-to-the-fg-act-en.pdf>

Objectives, Indicators and associated targets

Maximising potential to contribute towards CCT objectives

STEM Gogledd will be committed to identifying supporting and developing the appropriate routes to enable participants to access the appropriate STEM skills education to achieve regionally relevant skills to enhance their ability to access to opportunities specifically in regional growth areas.

As part of this role the operation will:-

- Embed CCT objectives within the development of referral process for participants, delivery, and through its partnership with other stakeholders.
- Encourage participants to be more flexible and adaptable in changing labour market.
- Ensure activities will be available to all participants regardless of characteristics.
- Challenge assumptions and stereotypes.

Delivery

When delivering, all provision and materials will be available bilingually, and accessibility issues will be taken into account at all times to ensure equal access to all. To support this, the operation will commit to:

- Using a wide-range of positive imagery to represent gender, ethnicity and disability.
- Ensuring it will engage with partners and procured deliverers bilingually, if they request to do so.
- Ensuring that all training venues are physically accessible and, wherever possible, are close to good public transport routes.

Service Level agreements will be in place with joint beneficiaries, the importance of the above can be recorded within those agreements. This will be echoed in other agreements such as the Project Board TOR, Project Steering Group TOR.

BME/Migrant participants

Work is currently being undertaken on identifying potential disabled and BME/Migrant participants for the operation – the numbers are likely to be low in the population in North West Wales and also the level of support already available to these groups through existing services/charities it will need to be factored in.

Participants	Target Number	Rationale
Total Participants	550	STEM Gogledd operation proposes to work with 12% of the cohort.
Female Participants	302	STEM Gogledd operation proposes to offer targeted support for females; therefore propose to work with 55% female participants.
Male Participants	248	Based on the above, STEM Gogledd proposes to work with 45% male participants.

BME/Migrant Participants	6	STEM Gogledd proposes to work with 1% BME/Migrant Participants based on the actual participants for the Llwyddo'n Lleol project.
Disabled Participants	11	STEM Gogledd proposes to work with 2% Disabled Participants based on the actual participants for the Llwyddo'n Lleol project.

c. Further Strategic Criterion: Suitability of Investment

Need for the Operation

Target Participants

Target participants are young people between the ages of 11 and 19 years old, within an educational provision.

The target beneficiaries for this operation have been identified through a detailed assessment of North West Wales Data. The information below, is based on our current data set, but can be subject to change if we receive a new data set for the latest academic year from our partners. The following analysis has been completed with data sourced from WJEC, My Local School website³⁷ and Local Authorities.

Target beneficiaries have been identified with the following 3 rationales:

1. School/Further Education Attainment Levels

a. GCSE (THESE PERCENTAGES INCLUDE INDEPENDENT SCHOOLS)

According to Welsh Government data on attainment in secondary schools at GCSE and A Level for the academic year 2014/15, there were 4,383 pupils aged 15 taking GCSEs [includes independent school pupils] and 33 maintained mainstream secondary schools in North West Wales (excludes independent schools). The percentage of pupils in North Wales achieving A*-C grades in core English/Welsh First Language and Mathematics GCSEs was 82.7%. In Anglesey, this was 83.1%; in Conwy, 83.6%; in Denbighshire, 86%; and in Gwynedd, 88.9%.

In North Wales, 64.3% of pupils aged 15 achieved A*-C in GCSE Mathematics; 85.2% in GCSE Science; and 61.1% in GCSE ICT. STEM Gogledd will use these averages as a baseline for proposed targeting of STEM Gogledd Menu of Services to enhance, add value and bring vocational relevance to specific establishments who wish to increase the attainment and take up of STEM subjects beyond 14, 16 and 18.

Across North West Wales, GCSE Maths results ranged from 62.5% in Conwy to 66.9% in Gwynedd; 63.6% in Denbighshire and 64.5% in Anglesey. This compares to the figure of 64.4% of pupils achieving A*-C in GCSE Maths in Wales.

³⁷ <http://mylocalschool.wales.gov.uk>

Regarding GCSE Science results, 81.5% of pupils in Denbighshire achieved an A*-C grade; 84.3% in Conwy; 91.8% in Anglesey; and 94.2% of pupils in Gwynedd. The figure for Wales in GCSE Science was 84% of pupils achieving A*-C.

The greatest variance in results was in GCSE ICT with achievement of 36.2% at A*-C in Gwynedd and 88.5% in Denbighshire; and 48.3% in Anglesey and Conwy. The figure for Wales in GCSE ICT was 74% of pupils achieving A*-C. ICT is not a core subject and is not offered as a GCSE and/or A Level choice in all schools.

GCSE – SCHOOLS:

In 12 of the 33 secondary schools in North West Wales, A*-C achievement in Mathematics was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in 21 schools across the sub-region was higher than the national average level of achievement and ranged between 64.9% and 78.5%. The lower levels of achievement in the 12 schools ranged between 62.5% and 41.5% - the lowest being 23.0 percentage points below the national average.

Better performance in terms of A*-C achievement in Science across North West Wales; however, in five of the 33 secondary schools, A*-C achievement in Science was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in 28 schools across the sub-region was higher than the national average level of achievement and ranged between 84.4% and 99%. The lower levels of achievement in the five schools ranged between 83.6% and 69.5% - the lowest being 14.9 percentage points below the national average.

Less than half (15) of the 33 schools offer ICT as a subject at GCSE. Attainment at A*-C in 12 of the 15 schools was lower than the Wales national average and ranged between 68.4% and 14.8% - the lowest performing school was 59.2 percentage points lower than the average. Only three schools achieved higher than the average, ranging between 75.6% and 96.7%.

b. A LEVEL (THESE PERCENTAGES INCLUDE INDEPENDENT SCHOOLS)

In 2014/15, there were a total of 1,611 pupils aged 17 [includes independent school pupils] taking A Levels in North West Wales (entering a volume equivalent to 2 A levels). In total, 602 pupils in North West Wales studied science subjects [includes independent school pupils], including Physics, Chemistry, Biological Sciences and Other Sciences.

In North Wales, a greater percentage of pupils (80.4%) achieved an A*-C grade in Mathematics at A Level than at GCSE (64.3%). In A Level Physics, 57.9% of 17 year olds achieved A*-C; 77.6% in Chemistry; 68.6% in Biological Sciences; and 61.6% in Other Sciences. In A Level ICT, 64.1% of pupils achieved A*-C, while at GCSE the proportion was 61.1%.

In A Level Maths, the lowest figure for achievement in North West Wales at A*-C was 79.3% in Denbighshire, the highest being in Gwynedd at 87.6%, 83.8% in Conwy, and 84% in Anglesey. This compares to the figure of 85% of pupils achieving A*-C in A Level Mathematics in Wales.

In A Level Physics, the smallest percentage at A*-C was in Gwynedd at 14.7%, and the greatest in Denbighshire at 84.6%. In the other counties, 40.5% of pupils in Anglesey

achieved A*-C, and 77.5% in Conwy. The figure for Wales in A Level Physics was 74% of pupils achieving A*-C.

Regarding A Level Chemistry, Anglesey had the smallest percentage of pupils in North West Wales achieving an A*-C grade, at 63.3%, while Denbighshire had the greatest at 82.8%. Conwy had 77% at A*-C, and Gwynedd 81.6%. The figure for Wales in A Level Chemistry was 79% of pupils achieving A*-C.

In A Level Biological Sciences, the smallest proportion of pupils at A*-C in North West Wales was in Conwy at 56.5%, and the greatest proportion in Denbighshire at 81.4%. Anglesey had 60.1% of pupils with an A*-C grade, and Gwynedd 75.7%. The figure for Wales in A Level Biological Sciences was 71% of pupils achieving A*-C.

A very small number of pupils were entered for Other Sciences at A Level (15 in total in North Wales) [includes independent school pupils], with the figures for Anglesey and Gwynedd unavailable. In Conwy, 37.5% of pupils achieved A*-C in Other Sciences, and 85.7% in Denbighshire. The figure for Wales in Other Sciences at A Level was 71% of pupils achieving A*-C.

A small number of pupils were entered for ICT at A Level (142 in total in North Wales) [includes independent school pupils], with the data for Conwy unavailable. No pupils achieved an A*-C grade in Gwynedd; 58% achieved A*-C in Anglesey, and 62.9% in Denbighshire. The figure for Wales in A Level ICT was 49% of pupils achieving A*-C.

A LEVEL – SCHOOLS:

Mathematics is only on offer in 22 of the 33 secondary schools in North West Wales. In 12 of the 22 Secondary Schools in North West Wales, A*-C achievement in Maths was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in the remaining 10 schools across the sub-region was higher than the national average level of achievement and ranged between 85.7% and 100%. The lower levels of achievement in the 12 schools ranged between 84.6% and 75.0% - the lowest being 10.0 percentage points below the national average.

Physics is only on offer in 13 of the 33 secondary schools in North West Wales. In five of the 13 Secondary Schools in North West Wales that offer the subject, A*-C achievement was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in the remaining eight schools across the sub-region was higher than the national average level of achievement and ranged between 75% and 84.6%. The lower levels of achievement in the 13 schools ranged between 73.3% and 57.1% - the lowest three schools being 16.9 percentage points below the national average.

Chemistry is only on offer in 15 of the 33 secondary schools in North West Wales. In nine of the 15 Secondary Schools in North West Wales that offer the subject, A*-C achievement was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in the remaining six schools across the sub-region was higher than the national average level of achievement and ranged between 83.3% and 100%. The lower levels of achievement in the 15 schools ranged between 76.5% and 33.3% - the lowest being 45.7 percentage points below the national average.

Biological Sciences is only on offer in 18 of the 33 secondary schools in North West Wales. In eight of the 18 Secondary Schools in North West Wales that offer the

subject, A*-C achievement was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in the remaining 10 schools across the sub-region was higher than the national average level of achievement and ranged between 74.4% and 91.3%. The lower levels of achievement in the eight schools ranged between 66.7% and 16.7% - the lowest being 54.3 percentage points below the national average.

ICT is only on offer in nine of the 33 secondary schools in North West Wales. In four of the nine Secondary Schools in North West Wales that offer the subject, A*-C achievement was lower than achievement on an all Wales level in 2015. A*-C pupil achievement in the remaining five schools across the sub-region was higher than the national average level of achievement and ranged between 50.0% and 83.3%. The lower levels of achievement in the eight schools ranged between 38.7% and 16.1% - the lowest being 32.9 percentage points below the national average.

A LEVEL – Number of Students Entered (Grŵp Llandrillo Menai)

According to LLWR data from Grŵp Llandrillo Menai on attainment at A Level for the academic year 2015/16, the STEM subjects with the greatest total number of students entered in North West Wales (Anglesey, Gwynedd, Conwy and Denbighshire) were Mathematics (199 students), Biology (114), Psychology (113), Chemistry (104), and Physics (79). The subjects with the least number of students entered were Creative Media/Film Studies (43 students), Electronics (40), Design and Technology (25), Computer Science (13), ICT (11), and Computing (eight). Applied Science, Engineering, and Health and Social Care are not offered as A Level qualifications at Grŵp Llandrillo Menai.

The breakdown in the number of male and female students shows that Maths, Physics, Computer Science, Computing, and Electronics were the most popular STEM subjects amongst boys. Subjects with a greater proportion of female students were Biology (44 boys and 70 girls), Chemistry (49/55), and Psychology (20/93). No girls entered Computing, with a total of eight boys, and only one female student entered Computer Science out of a total of 13 students. Only three girls, out of a total of 40 students, entered Electronics. In Maths, 115 boys and 84 girls were entered and 59 boys and 20 girls in Physics.

A2 LEVEL (Grŵp Llandrillo Menai)

The highest attainment rates at A*-C were in ICT (all five students passed), Design and Technology (91.7%), Maths (79.2%), and Physics (72%). The lowest attainment rates at A*-C were in Computing (none of the six students passed), Psychology (59.3% of students passed), Biology (60.5%), Electronics (64.7%), Chemistry (65.6%), and Creative Media/Film Studies (66.7%). No data was available for Computer Science at A2 Level.

In Design and Technology, six out of the seven male students achieved an A*-C grade (85.7%), and all five female students passed. In Maths, 33 out of 44 boys achieved A*-C (75%), and 28 out of 33 girls (84.8%). In Physics, 15 out of the 20 male students (75%) attained an A*-C grade, and three of the five female students (60%).

Five of the 10 male students achieved A*-C in Psychology, and 27 of the 44 female students (61.4%). Eleven out of the 17 male Biology students (64.7%) passed, and 15 of the 26 female students (57.7%). In Electronics, 10 of the 16 male students attained A*-C (62.5%), and only one female student entered A2 Level Electronics, attaining A*-C. Eleven of the 17 male Chemistry students passed (64.7%), and 10 out of the 15 female students (66.7%). In Creative Media/Film Studies, six out of nine boys attained A*-C (66.7%), and six out of nine girls.

2. AS>A2 Drop Out Rate (2014 & 2015)

The STEM Gogledd operation has liaised with regional education partners and received data from the Welsh Joint Education Committee on pupil achievement in 2014-15. The operation has used this data specifically to demonstrate the trends in pupils progression from those who achieve A*-C at GCSE in STEM subjects at 16 through to AS and A2 at 17 and 18 and the changes which occur during those two years.

Analysis of this data has shown that there is a significant decrease in pupils who achieve A*-C at GCSE and who then choose to continue with traditional STEM academic subjects post 16, despite having 'good' achievement grades. There is also evidence from this data of further decrease in the pupils who continue to study those academic STEM qualifications beyond AS to A2. The data shows a decrease of continuation beyond AS to A2 for Mathematics, Science, ICT and Design and Technology.

As an example, in depth data analysis from Gwynedd and Anglesey schools shows that 2,861 pupils achieved grades A*-C in GCSE Mathematics in 2014. The number of pupils from this cohort who then stayed on in schools to study AS Level Maths was 203, and the same cohort who continued through to A2 in Maths A Level was 154. The overall regional achievement of A2 Level Maths at grade A*-C for the four counties of this operation in 2016 was 298, a significant decrease in those continuing with Maths from the overall A*-C achievement at GCSE.

STEM Gogledd will work with regional partners, such as the GwE education consortium and 14-19 Coordinators, to offer suitable interventions, from the Menu of Services, to schools who receive support from the GwE Challenge Advisors relating to STEM subjects.

3. Work Experience

There is currently no compulsory or statutory requirement to ensure that real work experience outside the school takes place. However, Secondary Schools in North Wales can choose to offer their pupils a "block" of work experience. "Block" work experience is the scheme where students work with a placement provider for five or ten days consecutively, usually at the end of Year 10, however some schools chose to offer the block during Year 11, with schools offering further work experience then in Year 12. Schools have an additional option to offer Extended Work Experience, where students work with a placement provider one or two days a week over a period of time. It is intended for students who wish to follow a particular occupation as part of their curriculum and usually leads to, or is part of, a vocational qualification. The data

analysed was from 3 of the 4 counties (Conwy, Isle of Anglesey and Gwynedd), data from the one remaining county will be included once received.

Out of the 25 schools across the three counties, 19 of the schools offered work experience in the 2015-16 Academic Year with 16 of those offering at Year 10 and 3 schools in Year 11. Having said this, the full cohort in the schools participating in Work Experience did not attend. From the Year 10 cohort, 81% took up the offer of work experience. The 3 schools that offered Work experience in Year 11, 94% of the cohort attended,

Out of the 17 Secondary Schools across the three counties with a Sixth Form, 9 of the schools offered their Year 12 pupils work experience. From the Year 12 cohort 70% went on a week work experience.

Some schools do not offer Key Stage 4 or post 16 work experience, although where possible schools support post 16 to find work experience relevant to their university application.

How STEM GOGLEDD will use this data:

STEM Gogledd proposes to use this data to target potential participants in consultation with partners such as GwE and 14-19 Coordinators, to approach schools who are currently underachieving in their A*-C grades at KS4 and post 16, based on the data gathered above. With project officers based in the region and having local and regional knowledge, these schools will be offered a menu of STEM Gogledd services which will help them to add value to the National Curriculum subjects and lessons by reinforcing vocational relevance and key messages relating to STEM subjects beyond the curriculum and in their regional future and current employment context. This context will aim to provide further stimulus and inspiration to the teachers and the pupils to raise attainment and take up of STEM subjects at FE and HE and lifelong careers.

STEM Gogledd proposes to use the work experience data to target potential participants. STEM Gogledd will target schools who do not currently offer their students work experience, and target participants with an interest to have a STEM related work experience placement.

How will STEM Gogledd contact schools/collages? How will STEM Gogledd build relationships with schools/colleges?

The STEM Gogledd Project Development Group has representation from education including Deputy Head Teacher from Ysgol Tryfan, STEM Coordinator from Grŵp Llandrillo Menai, Education Manager from Techniquet Glyndwr, GWE Representative, 14-19 Network Coordinators and Gwynedd and Anglesey Post-16 Education Consortium Manager. The Project Development Group has been involved in the business plan development, and will be a key part of rolling out this project.

The STEM Gogledd project will be introduced and presented through the Head Teacher Forums, 14-19 Network, and Gwynedd and Anglesey Consortium Meetings. Presentations to these key groups will form part of the school buy in.

Identifying and overcoming the barriers

The Project Development Group participated in a brainstorming exercise; during the workshop 5 topics were discussed:

1. Identifying the barriers facing young people;
2. How will the project overcome these barriers;
3. Brainstorming the evidence;
4. Meeting the outcomes;
5. Activities and delivery.

The information for this section of the Business Plan was drawn up from this initial workshop which formed part of the project development. The Project Development Group consists of a group of experts who have expertise and experience working with young people on a daily basis. The Project Development Group has the following representatives Engagement Progression Coordinator, 14-19 Network Coordinator, Local School Deputy Head, Careers Wales, Further Education and Higher Education.

The barriers identified facing young people were the following:

1. Lack of awareness of the local and regional economic need and employment opportunities. Including the spectrum of STEM related careers; to include not only high skilled STEM subjects;
2. Lack of awareness of pathway opportunities in STEM Industry and Learning. Mismatch of subjects in school with the opportunities available locally;
3. Lack of awareness of local and regional skills requirements in the STEM Sector;
4. Lack of knowledge by individuals/teachers and parents of the above;
5. Low employability skills;
6. Lack or no transport available, especially in rural areas to access opportunities, such as careers days;
7. Outward migration of young people away from the local area/region;
8. Anxiety of learning to a more advanced level and lack of understanding of broader opportunities within the STEM Subjects;
9. Limited teaching time and knowledge about careers;
10. Lack of self confidence by young people. With the increasing popularity of social media, young people are faced with peer pressure that influences their subject choices/career pathways;
11. Lack of parental support;
12. Gender stereotypes. Lack of female role models in STEM Careers and pathways;
13. Lack of teaching resources and lab facilities in schools. Availability of support/resources available in Welsh Language;
14. Changes to the remit of Careers Wales has seen a gap within career provision;
15. Lack of inspirational STEM activities;

How will the project overcome these barriers?

The STEM Gogledd project will aim to contribute to overcoming the barriers identified above through the following provision:

1. Virtual STEM Club – STEM Hub that will provide access to a wide range of information/resources and provision to include career maps/pathways, labour market opportunity information.
2. STEM Co-ordinator – Facilitate communication between students/schools and industry, to promote curriculum enhancement and increase the take up and attainment in STEM subjects.
3. STEM Mentors – facilitate access to enhanced personalised STEM pathway information, guidance and support to advice on vocational, educational and career choices.

Current or planned provision

There is no equivalent provision available within North West Wales. Where complimentary national projects and provision exists currently operating in various locations within the region, we have consulted with them to ensure there is no duplication, but an opportunity as a proposed regionally focused and delivered project, to add value.

Supporting Evidence of Need

STEM Gogledd has been developed as a result of the findings a study by the North Wales Economic Ambition Board “Current STEM Provision in North Wales – primary to further education” (2014).

North Wales Economic Ambition Board “Current STEM Provision in North Wales – primary to further education”. This is a key document in providing local evidence of need and recommendations which largely mirror and complement the national policy drivers, influencing the direction of the STEM Gogledd project needs across North West Wales, and highlights the gaps in provision within schools and colleges across the area. This key regional document demonstrates that there is an abundance of national providers, materials and willingness to deliver STEM promotion. However, there is lack of coordination, curriculum integration, quality assurance and tangible outcomes towards raising standards. These are the key priorities in the development of a regionally focused and delivered STEM operation which will have regional insight and understanding, add sustainable value for learners in education, and will bring relevant and applicable STEM in education closer to the needs of our regional economy.

One of the key findings from a detailed audit undertaken by North Wales Economic Ambition Board in 2014 (Current STEM provision in North Wales – primary to further education), has highlighted the plethora of STEM interventions already on offer to schools and colleges across North West Wales. The audit identified that amongst the 1,674 interventions audited (not a 100% sample) 61% of these are ‘one off’ activities, which are creating confusion across schools in the region, and with lack of co-ordination it is proving difficult for schools

and colleges to gauge the impact that these activities are having on the pupils. This audit confirmed what the original audit report by DATEB concluded in 2011 that there was lack of coordination of STEM activities and no single organisation resourced to promote curriculum enhancement

The Welsh Government's Enterprise and Business Committee's inquiry into STEM (2014) called for a more strategic and joined up approach to interventions. The EBC called for a coherent plan for the promotion, monitoring and evaluation of STEM enrichment activities. The development of STEM Gogledd responds directly to this by having a joined-up regionally focused and strategic project that understands the needs of STEM within the region, due it being based here, working with schools here, and engaged with employers here, and not being distracted by project delivery elsewhere in Wales where different drivers demand a different response.

Project STEM Gogledd Development Group members concluded that the overwhelming evidence supported that any additional STEM activity currently being developed needs to be co-ordinated to ensure it is quality assured, joined up, adds value to curricular activity and has the necessary impact on increasing take-up and attainment.

Project STEM: Book of Insights³⁸ - The Project STEM: Book of Insights explores young people's attitudes, beliefs, motivations and behaviours that have an effect on subject choice and career paths. This research interviewed young people aged 14-17 years (including year 9, year 11 and year 12/FE College), as well as teachers and parents. Young people see their parents as role models, with a vital role in their career choice, although there is a need to educate parents on the breadth of opportunities available. Celebrities and famous business people are seen as role models, with a potential to use these types of role models to inspire career pathways. The need for young people to be aware of the different career pathways available is highlighted within.

The 3 key decision points are explored including Year 9 with decisions for GCSE, Year 11 with career or subject choices, and Year 12 for employment or higher education. Noted that "subject enjoyment and teenage milestones shape the learning journey." It appears young people are uncertain of the career they may pursue, and make their subject choices at GCSE based on subject enjoyment, therefore there is a need to promote the importance of subject choices for future career pathways. "Many reported having spoken with the schools career advisor but few reported that it was worthwhile."

The Perceptions of STEM were discussed, and it's noted that they are well established. Positive and negative perceptions within STEM subjects have been highlighted, including those around gender stereotypes within the subjects; as well as the perceptions that STEM is difficult and complex. "There is a lack of awareness of the alternative carer options in STEM, as young people associate STEM subjects with the traditional career paths of scientist, biologist, engineer, doctor which require higher education, or with academic activities such as research or teaching."

³⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/351433/BIS-14-899-STEM-book-of-insights.pdf

Careers Wales Annual Destination Survey 2015:

Continuing in full time education continues overwhelmingly to be the most popular choice of destination for pupils in each of the three Year groups.

Year 11 (North West Wales data)	
Full time education (school)	47%
Full time education (college)	42%
Year 12 (North West Wales data)	
Full time education (school)	83%
Full time education (college)	12%
Year 13 (North West Wales data)	
Higher Education	64%

Project Evaluations

STEM Gogledd has been developed taking into consideration lessons learnt from previous European Funded respective evaluations.

Llwyddo'n Lleol Evaluation – Llwyddo'n Lleol's evaluation identified the need for continued activities that increase employer engagement in education and increase awareness of local labour market opportunities, recommending that this should be included in proposals for new regional projects funded through the 2014-20 European Structural Funds. One of the project recommendations in terms of delivery was that sector events should be packaged as a series of events delivered over a period of time. The four local authorities and project delivery organisations should maintain the level of employer engagement with young people that has developed through the project. This should include maintaining links with employers and broadening their involvement in educational activities (e.g. work experience, work placements, mock interviews and mentoring). Monitoring and tracking recommendation that future projects should seek consent from participants to track their future destinations on a longitudinal basis, gaining this consent could enable a follow-up survey with a representative sample of participants to be undertaken in the longer term.

STEM Cymru Evaluation – STEM Cymru evaluation identified that Welsh medium students would definitely appreciate all materials be supplied in Welsh. Some stated that they weren't sure of the rules although this may be a general criticism of communications, rather than specifically related to their lack of confidence in English. Expose girls to female role models who have succeeded in STEM. Fostering both situational and long-term interest in STEM, and provide concrete strategies that teachers can use to do so.

Evaluation of the Careers Information, Advice and Guidance (CIAG) Project – CIAG examined the delivery and outcomes of the project along with the impact of participation on clients. The most valued elements of the CIAG project was the general help and encouragement, the provision of advice and guidance, information on careers, information on training, and support with CVs and applying for jobs. The CIAG project has also had knowledge of the labour market and identifying appropriate and suitable opportunities.

Evaluation of the Post 16 Education Consortium for Gwynedd and Anglesey - Timing in terms of the truncated delivery period has become an issue and with it this pressure has been distributed across the schools – within the context of tightening resources then this was clearly seen to be encroaching on school time. This was not factored into the delivery cost of the project and as the Consortium has developed in its role and stature so has the time commitment of the schools / Colleges with a concomitant impact on underlying real costs.

Evaluation of Techniquest and Techniquest Glyndŵr School Services – The evaluation recommends that consideration should be given to undertaking an annual/biannual survey of schools to explore their use of external STEM support (from all providers), to identify frequency/patterns of use, perceived benefits/impacts and areas of unmet need. A need to create more widespread and active links with higher education providers and STEM employers, for example, would raise awareness of opportunities and help inform pupils' decision making about further STEM study and future careers. The centres explicitly link elements of their programmes directly to curriculum delivery, and promote them as such to the schools they engage with, to allow teachers to identify where provision can have most value. Consider new approaches that will be attractive to secondary schools, such as specific events on subject choice for secondary pupils, as well as sessions for primary pupils at key transition points (to enhance familiarity). Although not explored specifically in the study, the common issues raised about travel costs and for some schools the long distances required to travel suggest that there may be value in exploring other options for delivery.

Section 2

a. Core Criterion: Delivery

The ultimate change sought from the operation is to increase the take up and attainment in STEM subjects amongst 11-19 year olds.

In determining the appropriate activities to deliver this change, the PDGs further to the policy context in Section 1 to draft the Operation Logic Table.

The PDG were then tasked with completing a ‘Preferred Options Matrix’ to determine their preferences as to how resources may be split between these outcomes. The PDG were asked to consider the delivery mechanisms for the activities identified, and how they would be delivered.

		PREFERRED OPTION		
		Must Have	Prepared to Consider	Might Accept
OUTCOMES	Pathways Promotion			
	Transition Programme			
	Increase Attainment and Engagement in STEM Subjects			

Following this exercise the preferred option for delivery was determined.

STEM Gogledd Preferred Option for Delivery

The operation will provide the following 3 key functions:

1. Coordination Function

Research has concluded that there is a lack of coordination of STEM activities across the region, exacerbated by national projects with little knowledge of our regional drivers and demands looking to deliver initiatives and outcomes based on the needs of economies elsewhere. The North Wales Economic Ambition Board study “Current STEM Provision in North Wales – primary to further education” highlights the lack of coordination, curriculum integration, quality assurance and tangible outcomes towards raising standards.

The Coordination Function would consist of two “STEM Coordinator” posts. The post holders would be based centrally and cover the North West Wales region. The STEM

Coordinator would be responsible for the North West Wales STEM Provision Mapping, as well as establishing, developing and maintaining the Virtual STEM Hub.

The STEM Coordinator would gauge the impact STEM activities are having on pupils through the STEM Hub including the STEM Club sessions and the reflective learning; promote curriculum enhancement; coordinate STEM activity and ensure quality assurance, add value to curricular activity and has the necessary impact on increasing take-up and attainment.

- Brokerage service– to ensure any activity is fit for purpose and maps to the curriculum. This would avoid schools being approached by numerous providers and would create a more coherent and meaningful offer.
- Facilitation of communication between schools and industry, to include:
 - o link STEM activities to the Curriculum;
 - o ensure the activity meets the requirements of the curriculum;
 - o ensure the needs of the industry are being identified and addressed;
 - o monitor the quality of interventions;
 - o additional interventions to promote girls into STEM careers;
 - o ensure longer term continuity and coherence of provision;
 - o address any issues at the schools and plug the gaps.
- Conduct a survey of key employers STEM skills needs to ascertain the skills gaps and gaps in qualifications and training provision they feel need to be in place to meet the demands of future opportunities. Link these findings closely with the region's Skills and Employment Plan and Demand Supply Assessment.
- Ensure all provision supports career pathways and contributes towards the STEM skills agenda.

2. STEM Hub

Develop a simple unique regionally focused web based tool for the project, which will add value for participants across North Wales.

Using the good practice from the Mapping Exercise for 16-24 support provision in North Wales, which is currently being transferred to an online tool, a Mapping Exercise for STEM Provision in North West Wales will be undertaken. In order to establish a baseline of the current STEM provision across the region, as part of procuring the STEM Hub the project will commission an initial North West Wales STEM Provision Mapping Document; this will map the current STEM offer available across the North West Wales region. This Mapping Document will produce an initial benchmark for the project, detailing current provision; highlight any duplication and gaps within the provision offered. This will contribute towards shaping the activities for delivery through the STEM Gogledd project. The information from the Mapping

Document will be the basis for the Virtual STEM club This Provision Mapping will act as a baseline for the project and then the mid term and final evaluation of the STEM Gogledd operation.

The STEM Hub will act as an umbrella over the project and will establish a foundation for STEM provision across the region.

The tool will be a closed pilot, only available for the STEM Gogledd participants with log in through their unique learner number.

The tool will give participants access for to all activities, experiences and resources available, as well as register and track their STEM Activity.

The STEM Hub service would be developed by a procured provider, with support from the STEM Coordinator.

The STEM Coordinator would be responsible for:

- Registering and verifying all STEM Provision on the STEM Hub, in order to ensure the provision is fit for purpose and will achieve the desired outcome.
- Quality Assuring provision by age/year group and sector/subject, and also verify the levels of achievement.
- Assessing each schools need for activity, and recommend suitable activities to meet those individual needs.

The STEM Hub would enable project staff to track achievement and impact against the recommended activity.

Incorporated within the STEM Hub would be a long term learning log with a tracking tool, which would track all STEM Activity of a young person, along with their curriculum learning outcomes; academic achievement and results. Each participant will be responsible for updating their learning log during the STEM Club sessions, these sessions will be supervised by the STEM Mentor, the sessions will give each participant to reflect on their STEM learning.

Additionally there would be a Reward Scheme, which would include certificates of achievements at different levels, along with additional STEM Activity rewards such as employer visits.

The STEM Hub would be a “one stop shop” for all STEM Provision information bespoke to North Wales, including sign posting facility with links to other providers’ resources including Careers Wales and employers.

- Identify clear links with the national curriculum to add value to the current provision.
- Link to Career Pathway Maps and Job Profiles – examples of the skills, qualifications, training and competencies related to job roles within the growth

sectors of the region. The desired qualifications to take advantage of employment opportunities.

- STEM Employer Profiles – case studies of local people who have achieved successful STEM related careers which can be used to support activities and enable follow-on sessions for teachers.
- Bilingual Resources - STEM Gogledd will provide Welsh Language resources where English Language only resources are available. This is considered crucial given the demography of the area.
- Interactive resources for students including Video Clips, STEM Quiz/ Career Map Quiz and STEM personality quiz.
- Menu of classroom providers.
- Menu of work experience employers.
- Welsh BAC Challenges - the STEM Hub would provide access to current STEM Welsh BAC Challenges for example those by Horizon. The STEM Coordinator would also develop new and exciting STEM Welsh BAC Skills Challenges.

The STEM Hub will be delivered by the STEM Mentors; this will include introducing the STEM Hub to STEM Teachers. The Mentors will identify participants, assess the need and then agree bespoke provision. The Mentors will host 1 STEM Hub session per term, therefore a total of 5 group sessions per year. During the STEM Hub sessions students will be given an opportunity to reflect on their STEM Learning and to register and track their STEM Activity on the Hub.

The STEM Hub will be a key part of project sustainability, with an opportunity as part of the operation's exit strategy for the STEM Hub to be developed and sustainable in terms of its continuation post project within North Wales. This continuation strategy will be discussed with possible partners.

As part of the project's STEM Hub, it will host a STEM Innovation Conference for North Wales. This regionally focused event would be held over two days at a central location. The event would bring together Innovative Employers to showcase future innovations and employment opportunities within North Wales. All STEM Gogledd's registered participants would be given the opportunity to attend the event. A follow up STEM Club session would be available following the conference for participants to record their learning and reflect on the impact from the conference.

3. STEM Mentor

The role is information, facilitation, mentoring and coaching role that will add value but not duplicate core career service provided by Careers Wales. The Mentoring support will be targeted, and will provide one to one bespoke support for participants. The STEM Mentor will facilitate access to enhanced personalised STEM pathway information, guidance and support their vocational, educational and STEM

choices. To ensure that participants are encouraged, inspired and made aware of the earning and learning opportunities available in the local and regional area.

- Raise participants' awareness of the needs of the local labour market and of emerging opportunities for employment through employer engagement particularly in non-traditional sectors key sectors in the region. Also identifying the range of STEM related careers at all levels, not only the highly skilled.
- Support key transition points during the academic cycle in relation to pathways progression to promote the engagement and continuation with STEM:
 - o Year 9 – At year 9 pupils have to make decisions for their GCSE subject choices. The subject choices at year 9 have a limited choice, but these are key choices for their career decisions in later life. Many don't know what career they will follow, they only have two and a half years subject experience from Secondary School, and on this basis most pupils will choose the subjects they enjoy
 - o Year 11 – This is a key transition point in life, with a decision for their future career path - to stay in school, move to Further Education, follow an apprenticeship or move into employment. The majority of pupils make this decision on the basis of subject enjoyment shaped by their GCSE experience.
 - o Year 12 – The next step within their career pathway is whether to move onto Higher Education or into employment. It is essential that learner understand how the subjects they study at school can prepare and equip them in their career pathways.
 - Raise awareness of alternative routes into careers in STEM such apprenticeships, higher apprenticeships, self-employment, employment in addition to further/higher education.
 - Raise awareness of the skills required within the STEM areas; to include employability.
- a. Employer Engagement - Industry specific employer engagement opportunities adapted to participant needs including; employer insight and industry visits. Role models are a great tool to inspire around careers and drive the relevance of a career for young people. Offer an opportunity to ensure young people are aware of the different career paths open to them, and highlight employment opportunity and the skills gap within STEM. Employer engagement is a way for pupils to learn about the excitement and potential of STEM.
- b. Industry Days - Specific focused events at core regional employers that will be supported by activities package prior to and following the event to contextualise the learning.
- c. Work Experience –. Work Focused Experience forms part of the Careers in the World of Work Framework, however there is no statutory or mandatory

requirement for schools to support and offer work experience. From the work experience analysis undertaken as part of the STEM Gogledd development, it is apparent not all schools within the region currently offer their students work experience. Career awareness and work experience is valuable and should be available to all students. The STEM Mentors will support young people to arrange good quality STEM Work Experience within North West Wales relevant to their career pathway; this will include vetting the employer as well as make arrangements for the work experience week. This will not duplicate any current offer by schools, and this provision will only be offered at schools where work experience is not on offer.

- d. Deliver STEM Hub Sessions – STEM Mentors will provide support for young people on how to access the STEM Hub. One STEM Hub group session will be offered per term for participants, totalling in 5 sessions per year. During the STEM Hub sessions participants will be given an opportunity to reflect on their STEM Learning and to register and track their STEM Activity on the STEM Hub.
- e. Girls STEM Saturday Club - STEM Gogledd proposed to host a series of Saturday Clubs. The Saturday Club would be offered to female participants at Year 9 in order to encourage STEM subject choices at GCSE and A Level. Each Saturday Club would run for a period of 6 weeks, with one session every Saturday. The Club would be an opportunity to learn more about Science, Technology and Mathematics – these clubs could be tailored to a particular subject or topic, or could be broader in terms of the STEM Agenda. The aim of the Saturday Club would be for girls to continue to study STEM subjects in the future, by discussing a range of STEM related topics. The Saturday Club would be an excellent educational experience with potential to learn about a range of Career Pathways.
- f. Online Chat Support – Following on from the STEM Hub Sessions there would be allocated time slots where the STEM Mentors would be available for online chat sessions. These sessions would be arranged at times outside school hours, and would be limited.
- g. Attend Parents and Options Evenings at schools to encourage attainment in STEM Subjects, and in order to add value to the knowledge provided to participants through this operation. This will enrich the project offer, educating parents to understand the pathway and importance of subject choices.
- h. Individual STEM Learning Plan – each participant will be given a negotiated individual STEM Learning Plan. The STEM Learning Plan will be negotiated by the STEM Mentor and the learner, where the STEM Mentor will have a one to one session with the learner to understand the learners’ needs. During this motivational 1-1 discussion, targets, outcomes and goals will be explored and SMART targets agreed. All information will be uploaded to the learner’s individual account and password protected on the STEM Hub, and can be reviewed during the STEM Hub Sessions. This will be a dynamic process between the Mentor and

each individual learner and targets will change and evolve as the learner develops.

Six bilingual STEM Mentors will be employed through the project, these would be based centrally and cover North West Wales. The STEM Mentors would be responsible for promoting and sharing best practice between schools.

The STEM Mentors would offer live online chat and skype contact through the virtual STEM Club on designated times.

For a clear understanding of a participant's journey on the project, we have developed three possible case studies.

Other Options for delivery:

Further to the Preferred Options Matrix a further 3 options have been identified and considered:

1. Provision to be available for all identified target participants. Provision to include Employer Engagement at school and within industry, Tailored STEM Mentor Provision to include identifying and arranging work experience opportunities, Co-ordination of STEM intervention supported with a basic virtual STEM Hub for student interaction.
2. Focus on those students not achieving A*-C Grades at A-Level. Provision to include Employer Engagement at school, Tailored STEM Mentor Provision, Co-ordination of STEM intervention.
3. Do Nothing – Status Quo

Operation Delivery Model

The project will be delivered by a combination of services directly provided by the beneficiary and services procured from external service providers.

The direct service elements will be delivered via the STEM Gogledd Regional Management Team. The Regional Management Team will be responsible for the co-ordination of services across the North West Wales region, ensuring the provision meets the identified need of individual schools and students.

The STEM Hub and the project Evaluation will need to be procured. Procurement arrangements for the project will follow the Lead Beneficiary's relevant procurement policies and established WEFO guidelines on Sponsorship, Partnership and Procurement, and the Public Contracts Regulations.

Funding Received in last 5 years

Cyngor Gwynedd EU Funding 2008-2015				
Project	Capital / Revenue	Grant Type	Programme	Grant
Genesis II	Revenue	ESF	Convergence	£1,018,605
Canolfan Rhagoriaeth Eryri	Capital	ERDF	Convergence	£106,675
Acedemi Hwyllo Pwllheli	Capital	ERDF	Convergence	£4,347,194
Partneriaeth Dysgu Gwynedd ac Ynys Mon	Revenue	ESF	Convergence	£462,845
Pont Briwet	Capital	ERDF	Convergence	£9,010,753
Cynllun Adfywio Blaenau Ffestiniog	Capital	ERDF	Convergence	£4,109,097
Llwyddo'n Lleol	Revenue	ESF	Convergence	£903,436
Potensial	Revenue	ESF	Convergence	1,127,412
Taith i Waith	Revenue	ESF	Convergence	£938,183
Caernarfon Town Centre and Bangor City Centre Public Realm	Capital	ERDF	Convergence	£6,136,427
Local Investment Fund	Capital	ERDF	Convergence	£1,415,215
North Wales Legal Services Collaboration	Revenue	ESF	Convergence	£177,680
North Wales ICT Collaboration Programme	Revenue	ESF	Convergence	£128,533
Gwynedd SET	Revenue	ESF/ERDF	Convergence	£178,937
Our Heritage	Capital/Revenue	ERDF	Convergence	£355,566*
Outdoor Tourism	Capital		Interreg IRELAND WALES PROGRAMME 2007 - 2013	£155,226
Greenseas	Capital	ERDF	Convergence	£145,459
Lon Las Ogwen	Capital	ERDF	Convergence	£350,240
Llwybr Arfordir	Capital	ERDF	Convergence	£2,122,583
Rural Enterprise Enabling Fund – Rural Economy	Capital/Revenue	RDP	Rural Development Plan	£647,500
Promoting Change in the Rural Economy through Innovation – Non Agriculture	Revenue	RDP	Rural Development Plan	£139,418
Promoting Change in the Rural Community – Agriculture	Revenue	RDP	Rural Development Plan	£274,362
Promoting Change in the Rural Economy through Innovation - Environmental	Revenue	RDP	Rural Development Plan	£153,190
Cymunedau Cynhyrchiol	Revenue	RDP	Rural Development Plan	£560,000
Rural Enterprise Enabling Fund – Rural Economy	Capital/Revenue	RDP	Rural Development Plan	£647,500
Llwyddo'n Lleol – Developing Enterprising Communities in Rural Gwynedd	Revenue	RDP	Rural Development Plan	£471,900

Rural Enterprise Fund – farming Families	Capital/Revenue	RDP	Rural Development Plan	£195,261
Innovative Development	Capital /Revenue	RDP	Rural Development Plan	£896,582
Enabling Diversification and Development (GWY52)	Capital/Revenue	RDP	Rural Development Plan	£575,680
Axis 3 Lead Body – CB1	Revenue	RDP	Rural Development Plan	260,957
Axis 4 Lead Body- CB1	Revenue	RDP	Rural Development Plan	142,001
Enabling Diversification and Development (GWY53)	Capital/Revenue	RDP	Rural Development Plan	£857,876
Innovation Development	Capital/Revenue	RDP	Rural Development Plan	£896,582
Enabling Farming households in Gwynedd to Diversify into Non- agricultural Enterprise	Capital/Revenue	RDP	Rural Development Plan	£461,970
Traditional Skills & Enterprise for Children	Revenue	RDP	Rural Development Plan	£54,400
The Discover Project	Capital/Revenue	RDP	Rural Development Plan	£120,123
Axis 3 Lead Body Costs – CB2	Revenue	RDP	Rural Development Plan	£542,459
Axis 4 Lead Body Costs – CB2	Revenue	RDP	Rural Development Plan	£331,878

Lead Beneficiary Record

Gwynedd County Council has led on the following projects:

Llwyddo'n Lleol

ESF funded project

February 2010 - March 2015

Four county project - Denbighshire, Conwy, Gwynedd, Anglesey

Total expenditure - £3,160,595.00

Total grant - £2,170,602.00

External evaluation and lessons learned reports already lodged with WEFO

Potensial

ESF funded project

June 2011 - August 2014

Four county project - Denbighshire, Conwy, Gwynedd, Anglesey
Total expenditure - £13,562,882.00
Total grant - £8,181,001.00
External evaluation and lessons learned reports already lodged with WEFO

Gwynedd County Council has the range of expertise in delivering EU project, we have staff available to deliver similar operations to those noted above through EU funding.

Legal Basis

Section 2 of the Local Government Act 2000 gives the Local Authorities the power to do anything which it considers is likely to promote or improve the economic, social and environmental well-being of the area.

Lead Beneficiary Governance arrangements

The proposed project management structure will include experience people in key positions who have background in the management and delivery of ESF & ERDF projects. The structure also provides specialist, professional staff at a range of levels, who can bring invaluable experience and knowledge to the management of the project.

Primary Risks and Dependencies

In order to manage the risks associated with this project a detailed risk assessment and risk management plan has been produced. The risk assessment has been scored and identified on the RAYG basis.

- Local Authority rationalisation – Capacity to deliver in the cuts agenda, increasing demands for organisations to rationalise budgets.
- Procurement timeline – potential of a low uptake of procurement opportunity.
- Quality of provision – poor quality provision and inconsistent delivery across the region.
- Engagement – lack of engagement or support for the operation.
- Safeguarding – Level of safeguarding process and protocols not adhered to. Potential risk for participants.
- Partnership working – difficulties managing a range of different services at a regional/national level. Could result in failure to achieve outputs.
- Communication ensure clear communication channels exist between Lead and Joint Sponsors, ensure clear communication channels exist between different stakeholders, this includes timely reporting to WEFO.
- Recruitment – Staffing issues.
- Outputs – failure to reach project outputs.
- Match Funding – unable to evidence sufficient match funding.
- Exit Strategy – project sustainability.

The projects risk management plan will be discussed and reviewed by the Regional Steering Group, which will meet quarterly. The Regional Project Management team will be expected to adhere to the risk management plan requirements on a day to day basis.

b. Further Delivery Criterion: Indicators & Outcomes

The target groups for this operation include the following:

- Young people in education identified by the teachers that are at risk of achieving grades C/C in specified STEM subjects and will benefit from added value inspirational engagement activities to improve the predicted grades.
- Young people unable to access specific STEM related work experience.
- Young people in education identified by the teachers and/or Careers Advisers that would benefit from additional STEM inspired activities to help them decide on choosing STEM options post 14, post 16 and/or post 17.

Given the evidence and research for the STEM Gogledd operation, the outputs are realistic for the needs of the young people.

During the delivery on the operation Schools will be identified on an individual needs basis in consultation with Regional 14-19 Network Forum, discussions with Careers Wales and GWE. This will be based on the three target criteria (noted above) for identification including attainment, work experience opportunities and progression post-16. This school identification will be prioritised according to the points against the three selection criteria. The project will be introduced and presented for marketing purposes through the Head Teacher Forums, 14-19 Network, Gwynedd and Anglesey Consortium Meetings. Once the selection criteria is set, schools will then need to approach the STEM Gogledd project, or then should there be a low uptake from schools the STEM Gogledd Coordinators would approach individual schools according to this criteria. Once the school registers their interest on the project, the STEM Coordinator will work with the teachers to identify students eligible for the STEM Gogledd Project. The students will then be referred to their STEM Mentor.

The operation will be measured against the Priority Indicators. The project will enable young people to increase the take up and attainment in STEM subjects.

The information within the Operational Programme was fundamental guidance which helped ensure that the proposed activities of the operation matched the overall programme requirements.

All outcomes will be recorded and reported as part of the regular Output Monitoring Process.

Longer Term Benefits

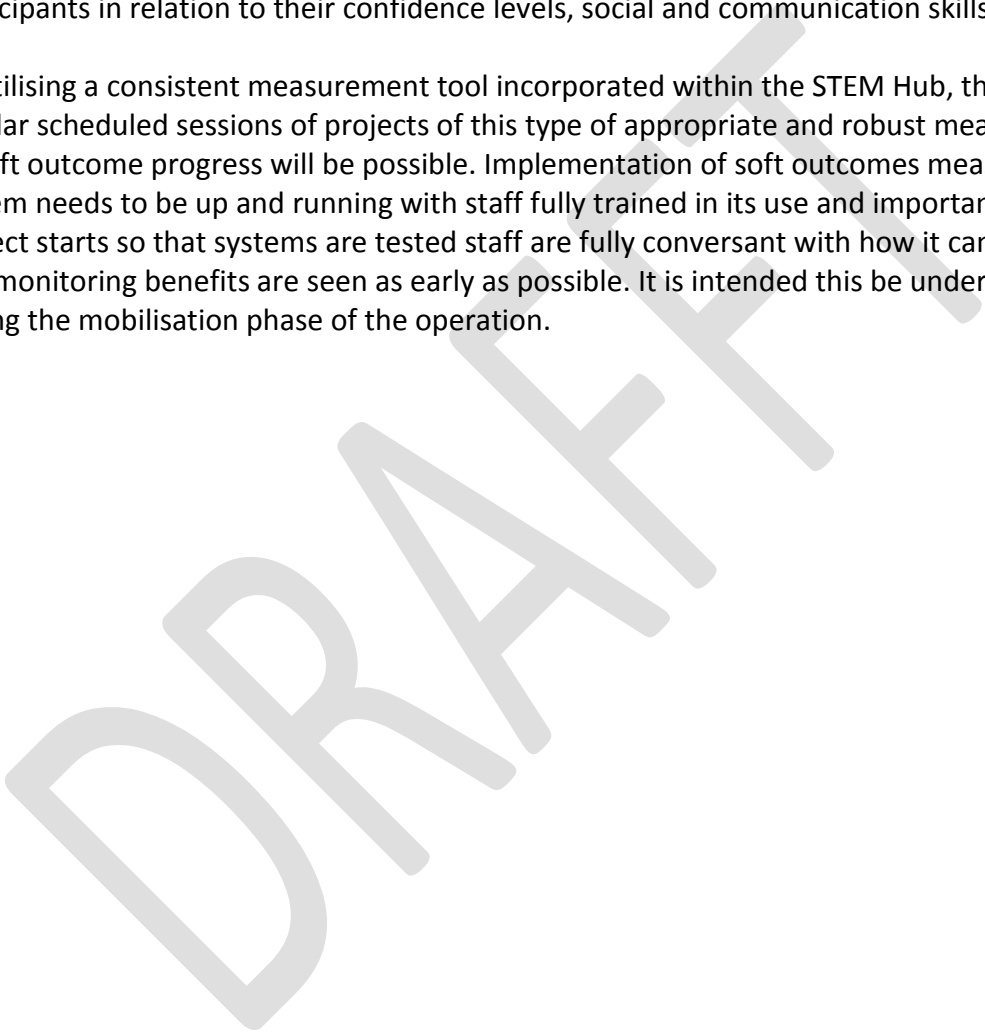
Increase in the take up and attainment in STEM subjects amongst 11-19 years olds in North West Wales, with improved grades at GCSE in STEM subjects; increased number of A Level entries in STEM subjects; increased attainment levels in STEM subjects at GCSE and A-Level; increase the future employability of young people and be responsive to the needs of the employers and the labour market of North Wales.

STEM Gogledd will contribute towards the break down of traditional gender stereotypes in employment, broadening horizons for non traditional job roles or employment sectors and addressing current under-representation of females in STEM subject in Higher Education and STEM based careers.

Short Medium Term

The short and medium term achievements will be measured with the use of a “soft outcome” measurement tool to establish their baseline and to monitor the progress of individual participants in relation to their confidence levels, social and communication skills.

By utilising a consistent measurement tool incorporated within the STEM Hub, through regular scheduled sessions of projects of this type of appropriate and robust measurement of soft outcome progress will be possible. Implementation of soft outcomes measurement system needs to be up and running with staff fully trained in its use and importance before a project starts so that systems are tested staff are fully conversant with how it can be used and monitoring benefits are seen as early as possible. It is intended this be undertaken during the mobilisation phase of the operation.



Output	Target	Rationale
Total Participants	550	STEM Gogledd operation proposes to work with 12% of the cohort.
Young People 11 -19 years of age – male	248	STEM Gogledd operation proposes to offer targeted support for females; therefore propose to work with 55% female participants.
Young People 11-19 years of age – female	302	Based on the above, STEM Gogledd proposes to work with 45% male participants.

14-16 year old participants	413	(75%)
16-19 year old participants	137	(25%)
Participants with a disability / work limiting health condition	11	STEM Gogledd proposes to work with 2% Disabled Participants based on the actual participants for the Llwyddo'n Lleol project.
Migrants / BMW / Minorities	6	STEM Gogledd proposes to work with 1% BME/Migrant Participants based on the actual participants for the Llwyddo'n Lleol project.
Immediate Results		
Young People 11-19 who continue to study a Maths, Science, Engineering and Technology subject post 16 – male	86	Data from the 2014/15 Academic Year has been taken into consideration as rationale. Pupils aged 15 = 4,383 Pupils aged 17 studying STEM subjects at A-level = 1,076 Therefore during 2014/15, 25% of the cohort pursued with a STEM subject post 16. STEM Gogledd proposes to increase the number of pupils following STEM Subjects post 16 by 10% to 35%. Given that STEM Gogledd proposes to work with a total of 550 participants, we would predict that at least 35% of these will continue to study STEM subjects' post 16. Continuing to study a STEM subject post 16 would include the following: - A-Level at School or College. - Vocational Training at Level 1 or above. The STEM subject or training pursued post 16 would reflect an individual's pathway, and career requirements.
Young People 11-19 who continue to study a Maths, Science, Engineering and Technology subject post 16 – female	106	35% x 550 = 192 192 x 55% = 106 female participants 192 x 45% = 86 male participants
Young People 11-19 completing training in maths, Science Engineering and Technology – male	161	As stated within the Business Plan, young people across North West Wales currently have a lack of awareness of labour market opportunities and STEM pathway opportunities. Alongside these barriers is the lack of coordination of STEM Activity across the region. STEM Gogledd proposes to address these issues, offering a coordinated approach to support young people to achieve their STEM Pathway. STEM Gogledd will allocate each participant with a STEM Mentor. The STEM Mentor will work closely with a participant to draw up an Individual STEM Learning Plan on the STEM Hub. Each STEM Learning Plan will include a range of interventions and activities to suit each individual's pathway.
Young People 11-19 completing training in maths, Science Engineering and Technology – female	197	Participants who complete 3 or more actions within their STEM Learning Plan successfully will be awarded a <i>STEM Gogledd Certificate</i> on completion of the projects. These actions within the STEM Learning Plan will include STEM Activity by partner organisations, employer engagement, STEM Career Research, Work Experience, Girls Saturday Club etc. All evidence of successful completion of the activities within the STEM Learning Plan will be logged on the participants STEM Hub account. A Certificate will then be issued through the STEM Hub. All participants gaining this certificate will be claimed against the "completing training" result.

Operation Activities

Young People 11-19 years of age (male/female)

Participants will be identified by initially an individual schools will be identified for the project as a result of low attainment levels or lack of work experience offer. The STEM

Coordinator will then discuss each schools individual needs with a nominated teacher/s. STEM Coordinator and the teacher will collaborate to identify individual participants eligible for the project. Once eligible participants are identified, the STEM Mentors will work with them on an individual learning plan, with an induction session to the STEM Hub. This will aim to increase participation rate in STEM subjects post 16.

Young People 11-19 who continue to study a Maths, Science, Engineering and Technology subject post 16

Identified participants will have their individual STEM learning plan to follow that will support their STEM studies at school, STEM Mentors will support individuals to continue their engagement with STEM, and encourage STEM subject choices post 16 to support their individual career pathway. Continuing to study STEM Subjects post 16 can include the following:

- A Level at School or College;
- Vocational Training at Level 1 or above.

Young People 11-19 completing training in Maths, Science, Engineering and Technology subject post 16

Identified participants will be allocated a STEM Mentor. The STEM Mentor will work closely with a participant to draw up an individual STEM Learning Plan on the STEM Hub. Each STEM Learning Plan will include a range of interventions and activities to suit each individuals pathway. Participants who complete 3 or more actions within their STEM Learning Plan successfully will be awarded a *STEM Gogledd Certificate* on completion of the projects. These actions within the STEM Learning Plan will include STEM Activities by partner organisations, employer engagement, STEM Career Research, Work Experience, Girls Saturday Club etc.

All evidence of successful completion of the activities within the STEM Learning Plan will be logged on the participants STEM Hub account. A Certificate will then be issued through the STEM Hub. All participants gaining this certificate will be claims against the “completing training” result.

Monitoring

The operation will be subject to the monitoring arrangements of the Operation beneficiaries and project staff will oversee daily functioning of the project. The beneficiaries have extensive experience in the field of EU regulations relating to programme management including monitoring and evaluating project performance. A team of specialist officers, who already have specific skills in these areas, will ensure that regulations and output targets are adhered to.

The operation will be monitored at regular intervals, prior to the completion of the quarterly financial returns. Additionally, a full-scale audit evaluation will be undertaken. Officers of the Lead Beneficiary will undertake a programme of visits to ensure that the operation is

adequately managed and any variation in the annotated outputs will either be resolved locally or reported to WEFO in circumstances that require it.

Participants will be recorded on a bespoke project database which will form part of the STEM Hub. This data base will enable the operation to record participant data relating to, progress made, skills gained, qualifications obtained and soft outcomes achieved. This bespoke project database will be in place at the start of delivery which will enable the Regional Management Team, STEM Coordinators and STEM Mentors to have constant access to all service delivery information.

This data will also feed into the NWEAB Regional Skills and Employment Data Dashboard which will gauge the regional impact and to ensure that additional accountability.

A delivery profile has been developed for this project and progress on participants activities against a range of indicators will be reported to WEFO on a regular basis. The Regional Management Team for the project will also develop additional monitoring data and there will be consultation with an independent evaluator regarding this.

Each participant will be uniquely identified. Whilst aiming to minimise the use of paper based recording, the project will also retain important documents such as those requiring a formal signature and any financial material such as invoices, which will need to be retained for audit purposes.

Incorporated within the STEM Hub will be a centralised data system relating to the project. This will enable the Regional Management Team, STEM Coordinators and STEM Mentors to monitor all beneficiaries on a regular basis. The Regional Management Team will assist the STEM Coordinators and STEM Mentors to ensure the appropriate and accurate collection of all required monitoring data. The use of an electronic recording and monitoring process will ensure that all information gathered is structured and reported in a consistent and meaningful manner.

Monitoring information gathered will be formally reported to WEFO on a quarterly basis, as part of the claim and output reporting process. Gwynedd Council will have lead responsibility for this, Gwynedd Council have vast experience of reporting project data to WEFO. We will comply with all WEFO requirements in relation to this process.

Evaluation

Procurement of an appropriately experience evaluator will be undertaken, following a procurement process during the interim of the operation. Bids will be invited from providers who can clearly demonstrate experience and expertise in evaluating projects of this type. It is anticipated that this evaluation process will combine both formative and summative techniques in order to deliver a full qualitative and quantitative evaluation. STEM Gogledd bases it's evaluation of the evaluation methodology of Potensial and will include 3 main phases:

1. Inception Document in July 2017, baseline of STEM data and socio-economic profiling data and evaluation framework in December 2017.

2. Interim Evaluation report in December 2018. Take into account the operation to date, to include evaluating the following:
 - a. The overarching aims of the operation remain relevant and valid;
 - b. The effectiveness and efficiency of the operations implementation;
 - c. The cost-effectiveness of the project in relation to the activity;
 - d. The results of each activity and its impact on the operation.
3. Final Evaluation Report due in February 2020. This report will look at activity up until the end of the project, and is designed to stand alone, building upon the interim findings with new and updated evidence to report on the project as a whole. This will include the following:
 - a. Did the operation achieve the stated objectives?
 - b. Were the projected targets achieved?
 - c. What has worked well and not so well?
 - d. How has the project impacted upon its target participant group?
 - e. How has the project impacted upon the local community and economy?
 - f. Have wider socio-economic factors impacted upon the operation and either enhanced or restricted its performance?
 - g. How efficient and effective were the processes of the operation in terms of planning and implementation?

The evaluation will focus on:

1. Project Management – The effectiveness of project procedures, including coordination, partnership, how the cross cutting themes have been addressed.
2. Impact – The extent of which the process has achieved it's strategic aims, objectives and output targets and impact on the target participant group according to both hard and soft outcome measurements.
3. Effectiveness – The extent which the project had engaged with and met the needs of the target participant group.
4. Efficiency and added value – The extent to which the project demonstrates value for money, and whether it has added value to existing programmes of support for young people in the area.

The following evaluation techniques are examples of techniques that may be undertaken during the interim and final evaluation:

- Scoping depth of engagement;
- Undertaking a baseline assessment;
- Management and officer interviews;
- Full case studies;
- Observation of activities;
- Direct participant contact through; questionnaires, focus groups and interviews (agreed % random sample).
- Reports received from agreed % of project activity areas to assess activity.
- Periodic interim summary reports.

The baseline activity, interim evaluation and final evaluations are not enough to ensure the success of the project. The nature of this work is such that ongoing evaluation is key to its

success. Regular assessment of achievement to date will allow for ongoing adjustments as the operation is implemented and developed. Evaluation will be on-going throughout the life of the project.

The evaluation will link in closely with the monitoring process, by using the statistical data collected to analyse the projects' progress and its performance against projected outputs and impacts. Evaluation reports produced by the Regional Manager will be based on monthly monitoring reports which will need to be completed by the local Project Managers and on their own detailed assessments.

Evaluation of activity will take the following formats:

- Smaller issues may be reported back informally from the STEM Coordinators and STEM Mentors to the Regional Management Team and resolved internally.
- The day to day development of activities will be discussed in monthly and quarterly meetings of the Regional Management Team. This will allow the opportunity to raise any problems or concerns and to work both locally and regionally to resolve any issues and to share best practise. Members of external bodies and agencies may be brought in to advise the groups where appropriate.
- Ongoing evaluation will take place through the monitoring of progress against targets, and any issues picked up at this point, will be resolved either informally or through the Regional Management Team.
- Ongoing evaluation will also be conducted regarding specific activities, to seek the opinion of participants and allow for the identification both of problems and of examples of best practise. This will take place before commencement of activities and either at the end (in the case of shorter-term activities such as events), or periodically throughout in the case of longer-term activities, in order to monitor progress/change in attitude.
- Ongoing occasional visits will be made by the Regional Management Team to examples of each activity to monitor the quality of provision, and also to ensure that the correct message and strategic fit with the programme's key aims and objectives (including cross-cutting themes) is promoted.

All information, assessments and monitoring reports will be disseminated within the programme's key partners by means of the Regional Management Team. All such information will also be reported back to the programme sponsors, by means of:

- quarterly narrative and indicator reports;
- other written and verbal updates regarding specific new information (including the publication of any assessments or reports);
- other written and verbal updates as requested;
- a quarterly claim (to provide financial information)

Relevant information will also be passed on to other external agencies at the discretion of the Regional Management Team or Programme Sponsors

Information felt to be of interest to the general public will be made publically available. In particular the evaluations findings will be made publically available, and will be disseminated through:

- Quarterly Regional Management Team meetings;
- Meetings with relevant Management Groups of the respective Local Authorities;
- STEM Hub;
- Links with the WEFO Communications Team;
- North Wales Economic Ambition Board – Regional Skills Partnership.

A total budget of £60,000 has been attributed to the STEM Gogledd Evaluation.

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c. Further Delivery Criterion: Management of Operation

Governance Structure

The Governance structure for the STEM Gogledd operation has been included below. The NWEAB will provide the overall Regional Strategic Lead; North Wales Partners of NWEAB are Local Authorities: Anglesey, Conwy, Denbighshire, Flintshire, Gwynedd and Wrexham, North Wales FE/HE Colleges and Universities and North Wales Business Council.

The Board will be supported by the North Wales Regional Skills Partnership, one of 4 Management Boards which reports directly to the NWEAB. Membership includes:

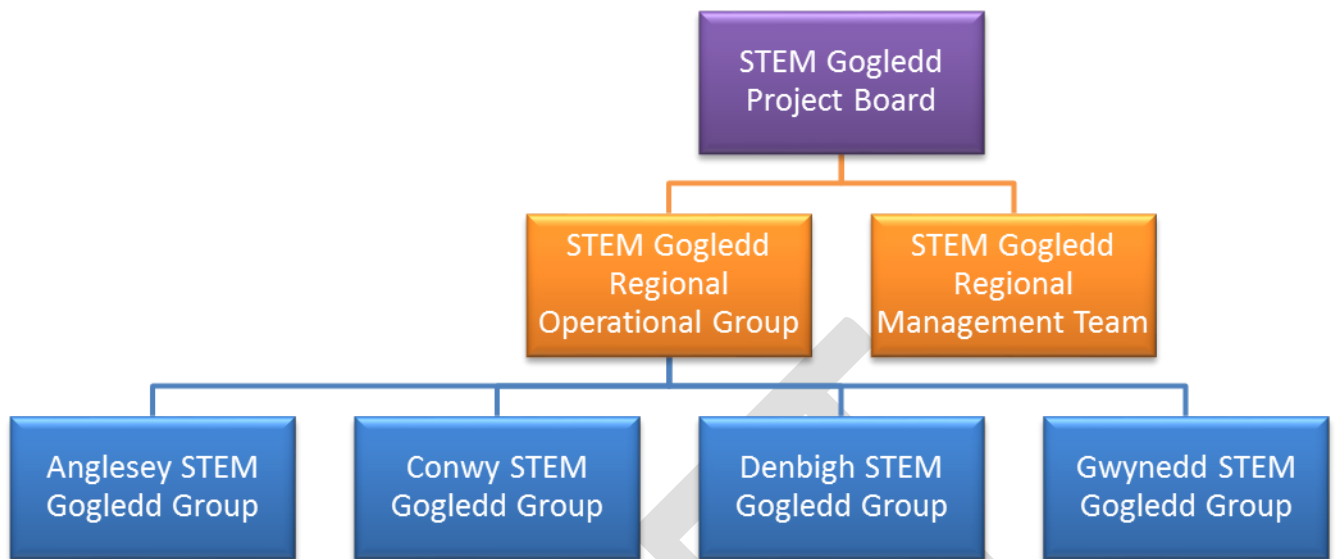
North Wales Regional Skills Partnership	
Name	Organisation
Sioned E Williams	Gwynedd Council (Interim Chair)
Iwan Thomas	NWEAB
Ffion Jones	NWEAB
Katie Edwards	NWEAB
Meurig Thomas	Welsh Government
Jayne Roberts	Welsh Government
Edwin Owen	NTfW
Trefor Jones	Bangor University
Dr Ian Rees	Grŵp Llandrilo Menai
Janine Downing	WCVA
Bev Lovatt	DWP
Sharon Williams	EPC's
Ashley Rogers	NWBC
Sasha Davies	Energy Sector – Horizon Nuclear Power
Gavin Jones	Manufacturing Sector – Airbus
Eiry Davies	Construction Sector – CITB
Gareth Jones	Creative and Digital Sector
Jim Jones	Leisure and Tourism Sector
Saffron Grover	Glyndwr University
Kevin Pascoe	Open University
Vicky Barwis	Coleg Cambria
Colin Brew	West Chester and North Wales Chamber of Commerce
John Gambles	14-19 Network



STEM Gogledd will have its own project board. Membership will be drawn from the Project Development Group which included all beneficiaries and key stakeholders.

The balance of experience and skills within this Project Group will prove to be invaluable to the success of the project. As the project board, they will be responsible for the overall direction and management of the project within the constraints set out by the Corporate or Programme Management. The Project Board will be responsible for the success of the project. As part of directing the project, the project board will:

- Approve all major plans and resources;
- Authorise and deviation that exceeds or is forecast to exceed stage tolerances;
- Approve the completion of each stage and authorise the start of the next stage;
- Communicate with other stakeholders.



Each Local Authority will have a local steering group which will report to the Steering Group and Regional Management Team. The Regional Management Team will then be responsible for reporting to the STEM Gogledd Project Board.

Staffing Structure

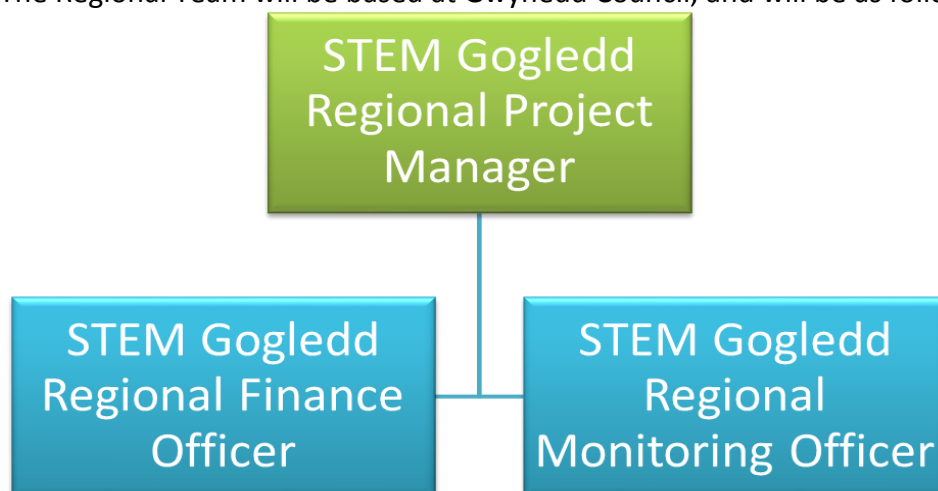
As the lead beneficiary, Gwynedd Council will have responsibility for the delivery of the overall operation. Gwynedd Council is highly experienced in the management and delivery of Structurally Funded project specifically. During the Structural Funds 2007-2013, Gwynedd successfully implemented 19 projects; in particular Gwynedd Council was the Lead Beneficiary on the Potensial and Llwyddo'n Lleol projects. We are therefore confident that we are very familiar with the technical and accounting requirements of European funding, and have developed high quality monitoring systems to ensure that these requirements are met. Within the Economy and Community department at Gwynedd Council we have a highly experienced **Strategy and Development Unit** who has kept fully up to date with new and additional requirements of the Convergence programme and is confident that existing systems can be updated and implemented.

As local authorities we are in a fortunate position of being able to draw on a wealth of knowledge in the implementation of the operation to ensure that all aspects of delivery from the development to the monitoring and financial reporting are robust at each stage. We have developed a proposed management structure which we believe allows sufficient capacity to implement these systems.

STEM Gogledd Regional Team

A comprehensive recruitment plan will be put into place as soon as the project is approved. This plan will ensure that the posts that are created through the operation are filled within a realistic timeframe to ensure that the project runs smoothly with its targets.

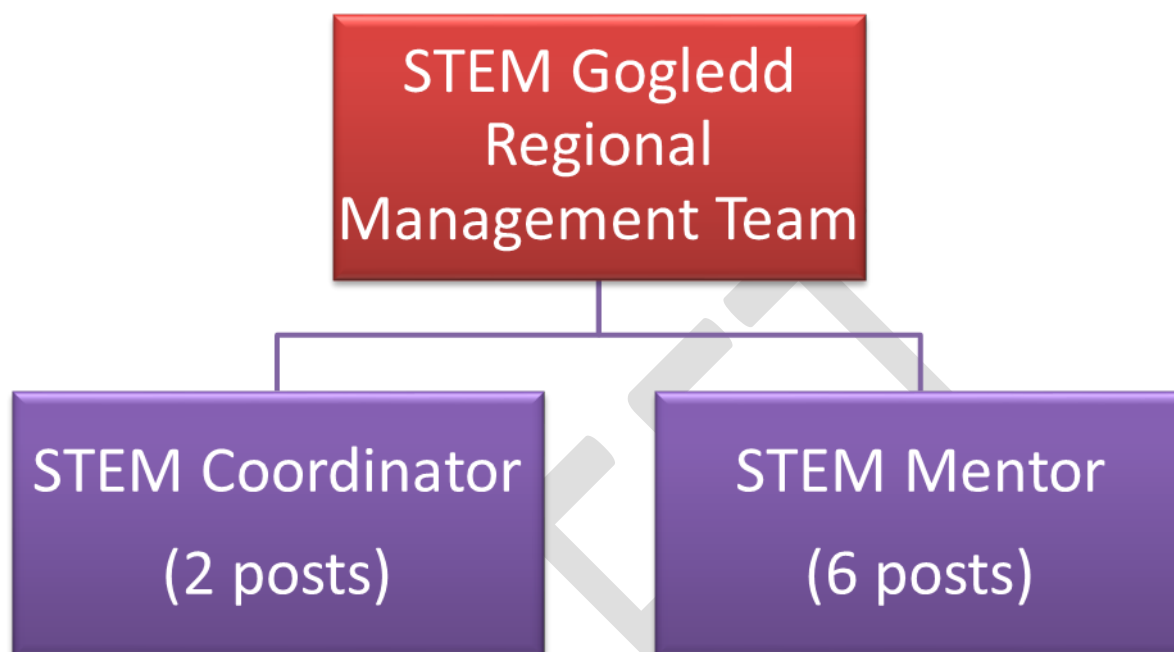
The Regional Team will be based at Gwynedd Council, and will be as follows:



Role	Purpose	Number of Posts	D M Fu
STEM Gogledd Regional Manager	To be responsible and accountable for the leadership, management and implementation of the STEM Gogledd project, in consultation with the STEM Gogledd Project Board. Ensure that STEM Gogledd is successfully delivered, in accordance with the objectives and targets contained within the project's Business Plan and Delivery Profile.	1	D
STEM Gogledd Regional Monitoring Officer	To be responsible for ensuring that the targets and objectives for the projects are met, by: <ul style="list-style-type: none"> - Developing and maintaining effective monitoring and evaluation processes. - Ensuring that consistent and effective use of the STEM Hub data base function to monitor participants on the project and that ISPs are adhered to. - Overseeing and monitoring the soft outcomes data. - Supporting the STEM Coordinators and STEM Mentors and their understanding of the STEM Gogledd Monitoring requirements to ensure effective processes are in place across the partner organisations. 	1	D
STEM Gogledd Regional Finance Officer	Assist the Regional Manager by managing the finance of this project in accordance with the Business Plan and the terms and conditions set by WEFO. Establish and implement a robust and rigorous financial performance monitoring system which ensures a thorough and systematic approach to the claims procedures to minimise any risk to the project of penalties. Responsibility for preparing quarterly financial claims.	1	D

STEM Gogledd Delivery Team

STEM Gogledd will appoint a Regional Delivery Team which will cover North West Wales.



Regional STEM Gogledd Delivery Team			
Role	Purpose	Number of Posts	D M Fu
STEM Coordinator	The Coordinators will be responsible for facilitating the e communication between students/schools and industry, promote curriculum enhancement and increase the take up and attainment in STEM Subjects. Responsibility for establishing, developing and maintaining the Virtual STEM Hub. Gauge the impact STEM activities are having on participants.	2	D
STEM Mentor	The Mentors role will be to provide information, facilitate, mentor and coach participants. Facilitating access to enhanced personalised STEM pathway information, guidance and support their vocational, educational and STEM Choices. The STEM Mentors will be responsible for delivering all aspects of the Virtual STEM Hub including hosting a termly STEM Club session.	6	D

Each officer appointed to all the above posts will need to demonstrate that they have the necessary skills and experience required to fulfil the roles. Each member of staff will undergo a specific induction to the STEM Gogledd operation, which will include:

- An introduction to STEM Gogledd, its background, aims and objectives and context (including a contextual overview of the ESF Operational Programme, and relevant Strategic Framework).
- The management structure of STEM Gogledd, how the work integrates and the reporting structures.
- The technical and accounting requirements of managing and delivering the project.

All project staff will receive specific training in the managements systems which will have been developed by the Project Manager.

Tender Documentation

STEM Gogledd will be undertaking a procurement exercise to appoint a provider to design and develop the STEM Hub.

Risk Management

A Risk Log has been developed for the project it includes a detailed description of the risk, consequences of the risk, the inherent risk score, mitigating actions and a residual risk score. A risk owner is also identified for each risk with regular dates for review.

The risk Management Plan will be overseen by the STEM Gogledd Steering Group which will meet quarterly, and identified officers will be expected to adhere to its requirements on a day to day basis. The Terms of Reference of the Regional Board will ensure that all potential risks are identified and addressed and that all the terms and conditions of the project are fully adhered to.

Procurement: Procurement by the project will adhere to the Procurement Guidelines set by the Lead Beneficiary's Procurement Team, and all procurement will adhere to the WEFO Guidelines. Minimisation of risk will be achieved by the inclusion of a dedicated Finance officer, as part of the Regional Management Team. This officer will be responsible for ensuring that the procurement processes being undertaken are consistent and adhere to the relevant requirements.

Project Targets – Failure to reach project outputs. Close monitoring by the Regional Management Team across the project. Regular monitoring of outputs during quarterly monitoring meetings and Regional Management Meetings. Any issues will be discussed with the PDO, RME or CCT Teams immediately if project is unlikely to achieve certain outputs.

Management and IT Systems

Gwynedd Council as lead beneficiary will be responsible for purchasing equipment as per their ICT agreements and policies.

Staff employed on the project will be provided with laptop bundles and mobile phones where appropriate. Every effort will be made to minimise costs by reusing or recycling equipment from previous EU projects.

It's anticipated that staff in particular the STEM Coordinators and STEM Mentors will work flexibly from a range of locations according to need. Gwynedd Council's lone working and flexible working policy will apply.

Email communication will predominantly be used in order to ensure that all beneficiaries are able to communicate efficiently and consistently.

Closure / Exit Plans

Project Closure will be managed following the best practice from the 2007-2013 EU programme and will be based on the closure processes of Potensial and Llwyddo'n Lleol.

Project Closure Guidance will be issued, designed to assist the STEM Coordinators and STEM Mentors to ensure that they effectively close their respective projects in accordance with the relevant WEFO European Regulations.

The Regional Management Team will work closely with all staff to ensure the process is managed effectively.

The Project Development Group agrees that this operation must aim to be sustainable. To address the barriers, we recognise the need to work collaboratively and develop processes that will help young people with the development of this operation. This is part of the long term strategy to embed the operation's activities within the partner organisations.

The Regional Management Team will lead on the development of a robust Exit Strategy which will undertake an options analysis of a range of options.

Legislation

The operation will ensure that it complies with all relevant legislation. Links with officers within Gwynedd Council will be made including Equality Officers.

Equality Act 2010 – In particular in regards to recruitment and promotion. We will ensure that all recruitment and job opportunities are made available to all individuals, including those with protected characteristics in line with the Equality Act 2010.

Disability Discrimination Act 1995 & 2005 – The Act promotes the equality of opportunity for disabled people.

Welsh Language Act 1993 and Welsh Language (Wales) Measure 2011 – Establishes the principle that the Welsh Language should be treated no less favourably than the English Language. The operation will comply with the Lead Beneficiary Welsh Language Policy and will provide all support and documentation bilingually to participants.

Well-being of Future Generations (Wales) Act 2015 – The Act aims to make the public think more about the long term, work better with people and communities and each other, look to prevent problems and take a more joined-up approach.

All Wales child protection procedures (All Wales Child Protection Procedures Review Group, 2008) – They provide a common set of child protection procedures for every safeguarding board in Wales.

Promotional Activity

Each relevant aspect of the Welsh European Funding Office Information and Publicity Guidelines 2014-2020 will be implemented, in particular:

- The use of the correct Structural Funds logos and branding on all publicity materials, stationery, literature, promotional materials, banners, website etc.
- Close liaison with the WEFO Press and PR team, especially for the sign-off of press releases, STEM Hub and other publicity materials..

1. **Promote project opportunities to target participants** – Promotion through, project staff and school teacher.
2. **Stakeholders** – See stakeholder analysis below:



3. **Results and Impacts** – This operation will adhere to all the applicable requirements of structural funded projects and will seek to publicise the support provided by ESF Funding. This operation will build upon the experience gained from previous ESF funded projects in raising the profile of STEM Gogledd.
4. **Dissemination of best practice** - Evaluation reports and other promotional materials will be made publically available. Representatives of the project will attend relevant conferences to present the project through exhibitions, presentations and workshops to network with other similar organisations.
5. **Full acknowledgement of the funding from the European Union**- Full acknowledgement of the Structural Fund contribution to the project funding will be included within all press and media reports. Specific acknowledgement will be achieved in a variety of ways:
 - a. There will be formal press releases to newspapers/television/ local and national radio, on confirmation of funding and at any relevant major milestone in the life of the project.
 - b. All literature and materials for ESF will display the appropriate logos for ESF
 - c. All public notice information, e.g. recruitment processes will fully recognise and inform the reader of the contribution made to the project through the structural funds.

Our previous experience in managing ESF 2007-2013 projects has afforded us a high degree of expertise in gaining good levels of positive coverage of project activity and we will bring this to bear on the Potential project.

6. **Where you will ensure acknowledgement of the funding received from the EU is displayed i.e. website, literature etc ensure accessibility**
 - Press Release
 - All literature and materials display ESF logo
 - All beneficiaries will have the support and provision of ESF clearly explained to them.
 - All Delivery partners involved in the project are aware of ESF funding
 - Plaques at all main delivery sites
7. **Europe Day (May 9th)** – Europe Day will be promoted each year by means of a dedicated press release, celebrating the work of the operation to date (or over the past year) and publicising key achievements. Attendances where possible at existing events and campaigns run in each local authority area to promote Europe Day. The EU Flag will be displayed at the Lead Beneficiary HQ during the week.
8. **Beneficiary Awareness of EU Funding** – All project literature and support material including beneficiary forms will include the appropriate ESF logo and recognition of the European Funding provided. All participants will be made aware of EU funding at the point of engagement.
9. **Links with WEFO PR Team** – The project Management Team will build and maintain a close liaison with the WEFO PR Team. Any PR Activity will be sent to the WEFO PR Team for comments prior to release.

All marketing, PR, training materials will be made in accessible formats for the individual concerned and this includes large print, as well as being made available bilingually.

Section 3

a. Core Criterion: Financial & Compliance

Lead Beneficiary Background

Gwynedd Council is a unitary authority and was established on 1 April 1996.

Declarations

The County Council has no conflict of interest regarding the development of this Operation. There are no County Court judgements against the organisation.

Breakdown of Costs

A detailed breakdown of costs linked to the planned activities required for mobilisation and delivery has been developed.

Simplified Costs

The STEM Gogledd operation will be using the 15% flat rate (indirect) option calculated on the basis of the direct staff costs.

State Aid Status

We do not believe that State Aid regulations are applicable in this proposal.

Revenue Generation

There is no anticipated revenue generation within the STEM Gogledd operation.

Funding Package

See Delivery Profile.

b. Further Financial Criterion: Value for Money

In addition to the preferred option that has been proposed within the business plan, another 3 options have been considered for delivery.

1. Preferred Option
2. Provision to be available to all identified target participants. Provision to include Employer Engagement at school and within industry, Tailored STEM Mentor provision to include identifying and arranging work experience opportunities, Co-ordination of STEM intervention supported with a basic Virtual STEM Hub for student interaction.
3. Focus on those students not achieving A* to C Grades at A-Level. Provision to include Employer Engagement at School, Tailored STEM Mentor Provision, Co-ordination of STEM intervention.
4. Do nothing

The four options for delivery were discussed by SWOT Analysis:

	Option 1 – Preferred Option	Option 2 Reduced Provision	Option 3 Focus on A-Level
Strength	Bespoke Support. STEM provision coordinated. STEM Expertise available for pupils. Clearly identified provision presented to pupils.		Bespoke Support Pupils.
Weakness	Funding required.	Funding required. Lack of mentoring support. Universal offer. Capacity to deliver.	Funding required. Limited number Lack of transition
Opportunity	Coordinated approach. Quality Assured STEM Provision Pupil needs addressed. Increase in the take up of STEM subjects. Other STEM delivery agencies. Fill the gaps identified within STEM provision.	Basic Coordination function.	Increase in the take up of STEM subjects in HE. Additional mentoring A-Level.
Threat	Other projects.	Other projects.	Other projects.

STEM Gogledd will target young people aged 11-19 years old within secondary education, with an aim to increase their take up and attainment in STEM subjects. Bespoke one to one support and group activity will form part of the success of the operation – staff resources are vital in providing dedicated support to all participants in order to achieve the operations outcomes and results.

The table below shows the cost per participant against the considered options for delivery:

Option for delivery	Target Participant	Total Project Cost	Participant Cost	Option	Rationale
Option 1	550	£2,086,976	£3,794.50	This is the preferred option for delivery.	
Option 2	550	£1,596,043	£2,901.90	This option would be an universal offer for participants, with reduced mentoring support.	TPC for Option 2 is based on the same participant number as above but with less project activity. Option 2 includes the full Regional Team as in Option 1, but reduced mentoring support, with only 3 STEM Mentors and 1 STEM Coordinator employed.
Option 3	193	£1,376,655	£7,132	Option 3 would focus on students who are studying for their A-Levels, and would include bespoke support for a limited number of students.	TPC for Option 3 is based on provision for pupils studying at A-Level, with a total of 10% of the cohort (1,611). Option 3 TPC is based on a smaller regional team (1 Manager and 1 Admin Officer), as well as reduced project staff with 2 STEM Mentors and 1 STEM Coordinator.
Option 4	0	£0	£0	-	-

c. Further Financial Criterion: Long Term Sustainability

STEM Gogledd will be using the opportunity of European funding to make a difference to participants, increasing the take up and attainment of young people 11-19 years old in STEM subjects, equipping them with the information to follow a STEM career pathway. The STEM Gogledd evaluation will identify the need for continuation of the operation post funding, and this will be discussed with Local Authorities/Employers dependant on availability of budgets, together with other factors.

It is part of our long term strategy to embed these activities within each organisation. The qualitative legacy being the coordination functions of STEM activities across the region, continuing to ensure a coordinated approach to STEM activities.

The STEM Hub will be sustainable post project, and exit strategy for the STEM Hub will need to be discussed and developed with key organisations within the Region.

Project Closure

Project Closure will be managed following the best practice of the Llwyddo'n Lleol and Potential Projects as part of the 2007-2013 programme.

Project Closure guidance will be developed and issued, designed to assist STEM Gogledd staff to ensure that they effectively close the project in accordance with the relevant European Regulations and Welsh Government Requirements.

Management staff on STEM Gogledd will remain in post for 3 months following closure of project delivery in order to effectively manage project closure.

Gwynedd Council will ensure adequate resources are available to plan and implement the project closure smoothly. This will include briefing project staff, ensure all those involved are aware of the closure timescales and if the activity is to be transferred to another party – how this will happen. Project participants may also need to be aware of the project closure.

In light of the Brexit decision a Closure Plan will be drafted in the first six months, in the event of an early closure of the project.
