

Connecting Teachers with Industry

A Community Renewal Fund project delivered by EESW

Report prepared Arad Research

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Table of contents

1. Introduction	3
About the CTI project	3
Aims of the evaluation.....	3
2. Our approach / methodology	4
The Theory of Change	6
3. Activities supported by CTI.....	8
4. Appropriateness of the project design	10
5. Progress against targets (Outputs and Performance).....	13
Project management.....	13
Delivery challenges.....	14
Achievement of output targets	14
6. Outcomes	17
Value for money.....	19
7. Conclusions	21

1. Introduction

Arad Research was commissioned to undertake an independent evaluation of the Community Renewal Fund (CRF) project Connecting Teachers with Industry (CTI); a project aimed at offering teachers in primary and secondary schools, and colleges in Bridgend and Rhondda Cynon Taf (RCT) an insight into manufacturing and engineering and the careers available to young people in these sectors. It also included pupil focused events, aimed at enthusing pupils of the opportunities in STEAM subjects and careers.

The project was delivered by EESW in primary, secondary schools, and colleges located in Bridgend and RCT.

This report begins with a brief introduction to CTI (the project) and the aims of the evaluation. It then outlines the evaluation approach taken by Arad and the Theory of Change (ToC) which guided the evaluation towards identifying the outputs, outcomes and potential future impact that the project contributes to. The report then outlines the main findings of the evaluation research followed by some conclusions and suggested recommendations for any future delivery.

About the CTI project

The project has been designed to expose teachers to the excitement and wonders of manufacturing and engineering and make them aware of the range of innovative and rewarding careers available in the Advanced Materials and Manufacturing, Creative and Digital and Energy and Environment sectors in the South Wales region. Events provide the opportunity for teachers to experience first-hand the employment opportunities available and the skills required to undertake these roles in the future.

At primary school level, the aim is to highlight STEAM learning for pupils and how young pupils can be enthused by current STEAM activities funded for schools in their area. At secondary school level, event sessions have a more in-depth careers focus outlining career opportunities linked to studying STEAM subjects at Further Education/Higher Education (FE/HE), as well as sessions on apprenticeship opportunities and other career options. Events also include industry views on how careers messages can be integrated into the new Curriculum for Wales.

Aims of the evaluation

The aim of the evaluation is to gather evidence to assess the appropriateness of the project's design; the way it has been delivered and managed and its achievement against planned targets. The evaluation also aims to review the outcomes achieved; how these relate to the priorities of participating schools – particularly in relation to supporting the new Curriculum for Wales 2022. The evaluation also reflects on the project's achievements in relation to what worked well, and what challenges were encountered with a view of identifying the lessons learnt in the process.

2. Our approach / methodology

The evaluation was undertaken between September and December 2022. The evaluation research comprised of a mixed method approach including desk-based research, consultation with EESW team members, school and event visits to observe the delivery of CTI sessions and an online survey of teachers participating in CTI events.

The desk research involved reviewing the initial application forms, monitoring data gathered by EESW, progress reports and evaluation feedback gathered by EESW from teachers from participating schools.

The desk research was accompanied by initial discussions with team members from EESW and the findings were used to inform the Theory of Change, which guided the development of the research tools, including survey questionnaire and interview topic guides, used to undertake the evaluation fieldwork during the remainder of the study.

The evaluation team attended two CTI sessions delivered in primary schools and one site visit session at the Sony UK plant in Pencoed. Attending the primary school sessions and site visit enabled the evaluation team to observe how the sessions were being delivered and to gather some feedback from session deliverers, teachers, and the young people themselves.

The two primary school visits attended were in Bridgend. CTI sessions in RCT had already taken place prior to the evaluation commencing and therefore it was not possible, within the time frame of the evaluation, to attend sessions delivered in schools there. However, as the activities, and the team delivering them, were the same in Bridgend and RCT, observing the sessions delivered in Bridgend offered a good insight into how the project was delivered in primary schools across both local authority areas. Similarly with the Sony UK visit, although the plant is located in Bridgend the site visit event was attended by teaching practitioners and career advisors from RCT and Bridgend, offering the evaluation team an opportunity to gather feedback from attendees across both local authority areas.

An online survey was developed by the evaluation team and a link to it was distributed by EESW via email to 125 teachers from participating primary and secondary schools¹. The survey asked teachers to note how they felt the sessions supported their own knowledge and understanding of STEAM-related skills, jobs and career opportunities. The survey also gathered feedback relating to the extent which the project encouraged, enabled or supported the school to deliver other STEAM-related activities or events. Additionally, the survey asked teachers to note the extent to which they felt the project helped to support the school's planning for the new Curriculum for Wales 2022. The survey yielded responses from 11 teachers – six primary school teachers and five secondary school teachers. It is worth noting that where results do not sum to 11, this is due to one respondent who skipped most of the questions in the survey.

Eleven completed survey questionnaires were returned - five from primary school teachers located in Bridgend, and one in RCT. The survey yielded four responses from secondary schools in Bridgend and one from RCT. This is a fairly low response rate (less than 10%). This response rate highlights some of the challenges experienced by EESW gathering

¹ Emails were sent to 134 teachers – however 9 of these emails could not be delivered, therefore the number of teachers who received the email was 125

feedback responses from participating teachers. The survey findings offer a good insight into the views and experiences of a sample of participating teachers. However, the reader should be cautious when interpreting these findings as being fully representative of all participating teachers.

The Theory of Change

A Theory of Change (ToC) is a description of the steps that lead from a project's planned activities to the identified / desired outputs, outcomes and impacts generated as a result. It identifies and maps the connections between initial intervention and the intended goals.

The ToC steps identified for CTI are as follows:

Inputs

The main input has been the allocation of UK-CRF funding by Bridgend and RCT local authorities to enable EESW to design and implement the CTI project. Other inputs included EESW staff time and non-CRF funded time and support provided by teachers and other school practitioners at participating schools, in helping to coordinate and oversee the school sessions.

Activities

The activities supported by these inputs included:

- An initial focus groups held on the 9th February 2022 aimed at gathering feedback from teachers on the CTI project proposals, and to generate new ideas to feed into the project delivery
- events aimed at providing teachers with first-hand experience of the STEAM related career opportunities and the skills required to pursue these careers;
- secondary school level event sessions providing more in-depth careers focus, on opportunities for studying STEAM at FE/HE, as well as sessions on apprenticeship opportunities and other career options;
- improving soft skills which are commonly of concern with regards to work readiness and general employability during secondary school events;
- engaging with industry representatives to encourage their participation in events;
- in-school events for pupils. This may include class assemblies, careers days or INSET visits for teachers.

Evaluation evidence relating to activities supported by the project was gathered from monitoring reports and discussions with EESW managers.

Outputs

The outputs supported as a result of these activities, within the context of our ToC, are considered as:

- the number of schools who participated in the project;
- the number of events / sessions delivered in primary schools;
- the number of primary age learners participating in these events / sessions;
- the number of events / sessions delivered in secondary schools;
- the number of secondary school learners who participated in these events / sessions;
- the number of primary school teacher delegates attending industry events / visits;
- the number of secondary school teacher delegates attending industry events / visits;
- the number of industry organisations involved in, hosting or contributing to school sessions or activities.

Evaluation evidence relating to the outputs achieved were gathered from monitoring data produced by EESW. Performance was measured in relation to the extent to which the outputs recorded met the output targets set.

Outcomes

Intended or planned outcomes identified within our ToC include:

- Participating **primary school teachers** feel informed and enthused and understand importance of STEAM learning and are enthused towards STEAM activities in school.
- Teaching practitioners encouraged / enabled to deliver further classroom STEAM activities that support the new Curriculum for Wales 2022.
- Participating **primary school learners** feel enthused by STEAM activities and gain more of an insight into how STEAM skills are used in practice and gain practical experience to further develop their STEAM related skills and knowledge.
- Participating **primary, secondary and FE practitioners** use the knowledge and information they gained from the industry related activities to illustrate in the classroom how STEAM related subjects are used in industry.
- Participating **secondary, FE, and Careers Wales practitioners** feel informed and enthused about the STEAM related career and apprenticeship opportunities that exist locally
- Participating **secondary FE and Careers Wales practitioners** feel better equipped to provide advice to young people about the STEAM related careers and apprenticeship opportunities that exist locally
- Participating **secondary FE and Careers Wales practitioners** inform young people in schools and colleges of the career and apprenticeship opportunities that are available in the local area.
- The activities support the **Continued Professional Development (CPD)** of participating practitioners.
- Learners feel more informed about careers and opportunities in STEAM.
- Participating industry partners consider attending events to be worthwhile.

Evaluation evidence relating to outcomes gained were gathered from responses to the teacher survey, teacher comments included in feedback forms gathered by EESW, and observations of the delivery of CTI events.

Contribution to longer term outcomes

- More secondary school and FE learners consider a career in local STEAM related industries.
- Long-term links between schools and industry created, and existing ones strengthened.

It was not possible within the timeframe of the evaluation to gather direct evidence of longer term, impacts achieved. However, interviews with stakeholders gathered informed views on whether the project is likely to contribute to these outcomes in the future.

3. Activities supported by CTI

Before CTI events and activities were delivered, the project conducted an initial focus group with a sample of eight teachers from primary and secondary schools. During the focus group those attending were presented with the project aims and proposed delivery approach. The group was then asked a series of questions relating whether teachers would be interested in the project and what delivery approach would suit them best. The responses were used to confirm or adjust the project's delivery approach. A sample of the questions asked are listed below:

- Will your school support you in attending these events?
- Do you have a preference between an in-person event or a webinar?
- Which day(s) of the week would be best for events?
- What time(s) of day would work best for events? (Select all that apply)
- How far in advance would you need to make arrangements to attend an event?
- Which subject teachers would this [the project] interest?

How the project is delivered

The project delivered a series of different events designed around the feedback received by teachers during the initial focus group. Some of activities and events were directed towards teaching practitioners from primary and secondary schools as well as FE colleges, while others were directed towards learners in primary and secondary schools.

Site visits or webinar tours of engineering companies

Primary, secondary and FE teaching practitioners, as well as, in some instances, Careers Wales advisers, were given the opportunity to attend events or industry site visits aimed at providing them with first-hand experience of how industry works in practice.

During industry site visits participating practitioners from schools and colleges were given:

- presentations from industry representatives about the company and the work they do;
- a tour of the company site;
- information about the career pathways including apprenticeships available at these sites;
- an opportunity to ask questions to young graduates and apprentices working at the site.

One online webinar session was also arranged, during which, 14 participating teachers and practitioners received presentations and information about a company as well as a virtual / video tour of the company. As with the physical site tour this webinar session was delivered by company representatives and offered participants the opportunity to ask questions about the career opportunities for young people available at their site. Teaching practitioners were also offered the opportunity to attend seminar events, where employers and / or academics from University of South Wales would again offer a presentation outlining the work they do and the career opportunities available within STEAM related industries.

Participating organisations offering site visits and a webinar included:

- Sony
- Renishaw
- University of South Wales
- Aston Martin
- GE Aviation Wales (webinar event)
- Bridgend STEAM Academy
- Dragon Studios

Sessions delivered in secondary and primary schools about career pathways into STEAM industries

CTI sessions delivered in schools have been aimed at learners. In secondary schools, the EESW team offered careers-based assembly talks highlighting how STEAM skills and technology are used in industry as well as a focus on local industry and the work and career pathways they offer. Secondary schools were given the opportunity to deliver these sessions in planned school assemblies, careers lessons, PSHE lessons or tutor groups.

In primary schools the sessions were delivered as activities that included:

- an introduction to the Science, Technology, Engineering, Art and Maths elements of STEAM,
- The engineer, discussing their career pathway and how they apply Steam subjects to their job.
- an introduction into different forms of engineering and design
- a practical session involving groups of learners building a bridge from LEGO which was tested and judged in terms of structural strength and design aesthetics.

4. Appropriateness of the project design

Industry site visits

The basis of CTI's design, as suggested in its title, has been to encourage a closer connection between teaching practitioners and local industry and employers. EESW recognise that there has been a disconnect between education, FE/HE and industry for many years and the project aimed at rectifying this.

As noted in section 3, the initial project aims, and delivery design was presented to a focus group of eight teaching practitioners. Feedback from the group enabled the EESW delivery team to either confirm that their delivery approach was suitable and / or adjust the design to ensure that the delivery approach met the needs and availability of teachers.

Supporting teachers' CPD

The industry site visits and webinars were designed with a view that they would support the continued professional development (CPD) of participating teaching practitioners by offering them hands-on experience of how local industries operate, and to illustrate what takes place in a modern manufacturing or engineering site. The project aimed at making teaching practitioners more aware of the significance of changes that have taken place in workplace due to the ever-accelerating pace of technological development.

By providing this experience, the project aims to enable and encourage teaching practitioners to refer to what they have seen and learnt during the visit in lessons they deliver in the classroom. This would enable them to illustrate to learners how the subject area or skills they focus upon in the classroom relate to what takes place in industry, which would contribute to their ability to integrate careers and activity into the new Curriculum for Wales 2022.

Practitioners who attended these events offered positive feedback. For example, Arad attended a CTI event held at the Sony plant in Bridgend. The event was attended by 14 teaching practitioners: a mixture of primary, middle, and secondary schools as well as FE college representatives and two representatives from Careers Wales. This group of practitioners were given a presentation outlining what Sony does and how it operates. This was followed by a full tour of the site and a further presentation outlining the apprenticeship and graduate opportunities that Sony offer young people.

Those attending noted that they felt the visit was very worthwhile, particularly in relation to understanding what local industry employers do and the work and career opportunities that exist there.

"I often pass the Sony plant when I'm driving along the M4, but I never knew till now what they did there. I'll be able to tell my pupils in class what they do now – and hopefully arrange a site visit for them as well". (Teacher at Sony event)

Several teachers who responded to the survey also commented that they would "love" to be involved in more events and activities in the future.

Supporting CWRE and careers advice offered in schools and colleges.

The site visits are intended to raise practitioners' awareness of the local manufacturing and engineering career opportunities that are available to young people, enabling them to

provide good careers advice and guidance to their students. This supports the aims of the careers and work-related experiences (CWRE) – a further important aspect of the new curriculum.

Secondary school, FE College and Careers Wales practitioners attending the site visit in Sony noted that they particularly valued the information they gained about the graduate and apprenticeship opportunities that were available at the site, particularly information relating to how and when young people could apply for them. All these practitioners noted that they would relay this information to their students as soon as they returned to their school or college. All practitioners attending the site visit were also very keen to share their contact with the team at Sony with as part of their aim to develop and strength links between their school and local industry – further contributing to their delivery of the curriculum.

A secondary school teacher who had attended a webinar tour of an engineering company also felt that they had gained an insight into what opportunities there are for pupils, especially in the local area:

“Meeting new people, opening my eyes as well as pupils to what’s available locally, what skills are needed, better understanding of apprenticeships available to encourage Year 11 and 13 in the future”. (Secondary school teacher survey respondent)

The evaluation findings therefore indicate that the project’s focus and design is well suited to meet its aim of bringing teaching practitioners closer to industry and to support their CPD and their ability to relate industry practices to what they teach in the classroom – a key aspect of the new curriculum.

Enabling teaching practitioners to attend site visits

It was anticipated that some schools and colleges would find releasing teaching practitioners from schools and colleges to attend site visit events challenging. In order to address this, schools were offered funding to cover the cost of a replacement teacher while the teaching practitioner attended the event. Also as noted in section 3, one of the sessions were delivered online as a webinar tour to enable practitioners to access it from the school or college premises. Several other webinar tour sessions were offered to teachers, however, the number of teachers who signed up for these was not sufficient to enable the session to go ahead. These webinars were also organised to be delivered at times that minimised disruptions to the school timetable, and at times considered by teachers attending the initial focus group to be most convenient for them. However, as outlined in more detail in section 5 below, the project often struggled to attract the anticipated number of practitioners to attend these events – and consequently some planned events and site visits had to be rearranged or cancelled.

STEAM learning for primary school pupils

At primary school level, the project has been designed around the aim of raising young learners’ enthusiasm to engage with STEAM activities as well as outline how STEAM skills are used in practice in the world of work.

During primary school CTI sessions observed by Arad, year 6 learners were introduced to the different elements of the STEAM acronym and the different ways STEAM skills are used in design, engineering, and modern manufacturing industry processes. The sessions focused on bridges, including an initial presentation of the different types of bridges that exist around the world in terms of their design and structure. The presentation also outlined the roles played by individuals in designing and constructing them.

Learners then worked in groups of three or four to build a bridge using LEGO pieces. The bridges were tested at the end of the session to see how much weight they could bear before breaking. They were also judged on their design and appearance.

All the learners appeared to be very engaged in the activity and noted during the session how much they enjoyed it. Several of the learners said, during the sessions, that having learnt about what engineers did and participating in the activity, that they would like to become engineers after leaving school – something that most of them had not previously thought about.

A teacher interviewed during the Arad observation visit noted how engaging and accessible the sessions had been to pupils of all abilities. They used an example of a pupil in the class who has Additional Learning Needs (ALN). The teacher noted that it can often be difficult to engage this pupil in activities, but the pupil had remained engaged throughout the session and had worked successfully in a team without any arguments. The teacher also felt that the hands-on element of the session had been important in leaving a lasting impression on the learners, ‘something they can take forward and remember’.

Teachers surveyed also commented on how much the pupils had enjoyed the sessions:

“Excellent session offering information about career opportunities for boys and girls as well as an excellent practical activity using Lego”. (Primary school teacher survey respondent)

“Thank you for this wonderful opportunity. The children LOVED this session and were so excited and engaged during the session and after it”. (Primary school teacher survey respondent)

Highlight career and studying opportunities in STEAM for secondary school pupils

At secondary school level, event sessions aimed to have a more in-depth careers focus, with opportunities for studying STEAM at FE/HE, as well as sessions on apprenticeship opportunities and other career options.

It was not possible during the evaluation period for members of the evaluation team to attend any of the sessions delivered in secondary schools. However, feedback from some secondary schools who responded to the survey indicate that the sessions were well delivered and focussed on areas that were relevant to the learners.

One survey respondent noted that the sessions were delivered to year 9 students who were at a transitional stage where they were in the process of making their choices as to which subjects to focus on in their year 10 and 11 GCSE courses. This survey respondent felt that the session offered learners an insight into potential career paths that could inform their future education choices and career paths.

These findings indicate that the CTI project’s design and delivery has offered primary and secondary school pupils a good introductory insight into how STEAM activities are applied in industry. It has also introduced learners to ideas of career paths that are possible in engineering, design and modern manufacturing and the skills and qualifications required to pursue these paths.

5. Progress against targets (Outputs and Performance)

The CTI project started in January 2022 and was initially due to be completed by June 2022. In April 2022 the project was granted a time extension and a revised completion date of December 2022 was agreed.

The project has been reporting against the UK Government investment priority of 'Investment in Skills' and has agreed outputs, as part of the Grant Funding Agreement (GFA) with each local authority for the following:

- People - Economically Inactive
- People - Employed
- Organisations - Public
- Organisations - Voluntary Sector

UK Government published a Technical note for project applicants which also set out the detail - **Annex A: UKCRF indicator guidance** definitions for outputs and outcomes (<https://www.gov.uk/guidance/uk-community-renewal-fund-further-monitoring-and-evaluation-guidance-for-project-deliverers#annexA>)

Under these definitions, the project was reporting against the output of “of people supported to engage in life skills” and outcome of “People engaged in life skills support following interventions”. Both participating teachers and pupils were supported to engage in life skills as part of this project. Delivery of life skills to teachers, whilst not one of the UKCRF Annex A outputs, was included within the CTI application as it is a fundamental aspect of the project – i.e. to raise knowledge about STEM related career pathways, and therefore vital with regards to the project's overall objectives.

Given that both teachers and pupils benefit from the project, outputs relating to participating teachers and pupils have been reported separately to local authorities to ensure that there is a clear split between these groups of people.

Section 4 above outlined that the design of the CTI is well suited to meet the project's intended aims. The project has also been well delivered and has generated positive outcomes for participating teachers and learners – see section 5 below. However, the project encountered a number of challenges in meeting its planned outputs in relation encouraging teachers to attend site visits and seminars and being able to deliver sessions in primary and secondary schools.

Project management

The project has been delivered within the existing management and governance structure of EESW. Under the overall direction and guidance of EESW's CEO, the project coordination and delivery has been managed by the CTI project lead who oversees the delivery team made up of two project officers, responsible for arranging site visits and arranging and delivering in-school sessions. One of the project officers left in September 2022, and there was insufficient time left within the funding period of the project to recruit and train a new officer. However, the project lead was able to continue with the delivery of in-school sessions and the coordination of site visits, minimising any gaps in the project's delivery.

Overall, the project management arrangements appeared to have worked well, ensuring that planned output targets have been reached, see below, and all planned activities have been delivered to a high standard, see outcomes in section 6.

Delivery challenges

A key challenge has been the willingness or ability of schools to release teaching staff to attend the planned industry events. This is often a challenge faced by any project that requires teaching staff to be released from their scheduled teaching responsibilities. As outlined in section 4, the project tried to mitigate this challenge as much as possible by offering funding support to cover the cost of a replacement teacher. However, this had limited impact on the ability of schools to release teaching staff, as the availability of supply teachers to offer this cover was low – often due to many supply teachers not being available because of sickness.

The project also offered teaching practitioners the opportunity to participate in online webinars which did not require them to leave the school. However, the project still encountered difficulties attracting teachers to many events. High sickness rates amongst teaching practitioners, during the first half of 2022 also resulted in last minute dropouts from some planned events. As a result, six planned events had to be cancelled – see Annex 2.

Some of the teachers and other stakeholders interviewed noted that this lack of take up may also in part reflect the post Covid policies of many schools during 2022. It was noted that in the wake of disruptions to face to face delivery of lessons during the pandemic, many schools have been reluctant to release teaching practitioners from their teaching duties, even if adequate teaching cover is available. This was also noted in comments made by several teachers who responded to the CTI survey who referred to not being able to be released from the classroom as a particular challenge to participating in the project.

In light of these challenges, a change in focus for the project was agreed to include the STEAM career presentations, and hands on activities in primary schools outlined in section 3 above. Target outputs for the project in Bridgend and Rhondda Cynon Taf were revised to reflect these delivery changes – see table 5.1 below.

Achievement of output targets

Overall, the project achieved or overachieved on most of its revised output targets – see table 5.1 below. The exception to this were the number of teachers recruited to participate in industry site visits and webinars (89% of revised target in Bridgend and 74% of target number in RCT). Reasons for this shortfall are outlined in other sections of this report and include, amongst other things the inability of teachers to be released from their school teaching duties to attend the events.

The project achieved or over achievement on the total number of schools it engaged with across both local authority areas reflecting the extent to which the revised delivery of in-school sessions was well received by schools. In RCT most of the school engagement was in primary schools where engagement was 157% of the revised target. On the other hand, engagement with secondary schools in RCT was lower than planned, with the number of school visits recorded falling short of the revised target - only achieving 69%. However, although the number of secondary schools engaged with was lower than the revised target planned, the number of secondary school pupils engaged with during each visit was higher than the average of 50 anticipated. As a result, the number of secondary school pupils engaged with during these visits was considerably higher than the target planned (768 against a target of 450 – 172%). The opposite was true for primary schools engaged with in

RCT. Although the number of schools engaged with was higher than the target planned (11 against a target of 7 – 157%) the number of primary school pupils engaged with was lower than planned. This was because group sizes of the pupils engaged with during each session in the primary schools visited, were lower than expected, and / or consent forms for attending pupils were not returned and therefore their attendance could not be recorded.

In Bridgend, this discrepancy occurred in secondary schools where the project overachieved on its revised target by 140%. However, the number of secondary school pupils engaged with during these visits was only 81% of the proposed target. Reasons for this are similar to those noted above – i.e. lower than expected group sizes and / or a relatively low number of consent forms returned.

Table 5.1: CTI outputs planned against outputs achieved

CTI Outputs (Total)	Original Target	New Target figures- December 2022	Final achievement to December 2022	as % of reduced target	as % of original target
Pupils (Total)	3050	1840	2123	115%	70%
Primary	1700	1036	1053	102%	62%
Secondary	1350	816	1070	131%	79%
Teachers	328	166	134	81%	41%
Schools (Total)	46	38	40	105%	87%
Primary	25	20	24	120%	96%
Secondary	21	18	16	89%	76%
CTI Outputs (Bridgend)	Original Target	New Target figures- December 2022	Updated to December 2022	as % of reduced target	as % of original target
Pupils (Total)	1400	840	933	111%	67%
Primary	800	486	638	131%	80%
Secondary	600	366	295	81%	49%
Teachers	142	73	65	89%	46%
Schools (Total)	22	18	20	111%	91%
Primary	16	13	13	100%	81%
Secondary	6	5	7	140%	117%
CTI Outputs (RCT)	Original Target	New Target figures- December 2022	Updated to December 2022	as % of reduced target	as % of original target
Pupils (Total)	1650	1000	1190	119%	72%
Primary	900	550	415	75%	46%
Secondary	750	450	775	172%	103%
Teachers	186	93	69	74%	37%
Schools (Total)	24	20	20	100%	83%
Primary	9	7	11	157%	122%
Secondary	15	13	9	69%	60%

6. Outcomes

Many of the outcomes supported by the CTI project are already outlined in Section 4 above i.e.:

- Supporting teachers' CPD
- Supporting CWRE and careers advice offered in schools and colleges
- Enabling teaching practitioners to attend site visits
- STEAM learning for primary school pupils
- Highlight career and studying opportunities in STEAM for secondary school pupils

Evidence presented in Chapter 4, and further demonstrated below, suggests that CTI activities and events have been successful in achieving these outcomes for teachers and pupils.

The remainder of this section outlines other outcomes and benefits generated by the project.

Reasons for engaging with the project

Surveyed teachers were asked what their motivation for participating in the project was. Responses varied according to the type of activity they had participated in. For example, teaching practitioners who had participated in industry site visits referred to the opportunity this offered them to support their learners to access apprenticeships and other options for entering the engineering and STEAM related industries. Primary school teachers who had engaged in the classroom sessions referred to the opportunity they offered learners to have a *'broader knowledge of what opportunities are available to them in the future'*, as a reason for their participation. Reasons for participation offered by some secondary school teachers included the opportunity the assembly sessions offered to *'encourage pupils to take STEM subjects for GCSE and to build on their knowledge and understanding of the importance of STEM in the curriculum'*.

"[My motivation to participate was..] to make sure we as lecturers are delivering Industry relevant material and staying in touch with local industry with the hope of beginning partnerships which lead to students being considered for apprenticeships". (FE teaching practitioner survey respondent)

Providing teachers with an insight into industry which they can incorporate into their teaching

Feedback received from teachers in participating schools suggest that the project successfully provided teachers with an insight into industry. All teachers (10) who responded to this survey question agreed with the following statements (with three strongly agreeing (30%) and seven agreeing (70%)):

- My knowledge and understanding of how STEAM-related skills are used in industry has improved
- My knowledge and understanding of the STEAM-related jobs and career opportunities available to young people has improved

The majority (80%) of teachers who responded to the survey also agreed with the statement "I now feel more confident advising learners about progression routes and career opportunities in STEAM-related jobs / industry": this included three who strongly agreed (30%), five who agreed (50%), and two who neither agreed nor disagreed (20%).

A primary school teacher interviewed during a classroom session echoed this and noted that they felt that they had learnt things from the session in relation to how STEAM activities are applied in industry. They also noted that they planned to pass this information on to pupils during future lessons.

Almost all teachers who responded to the survey agreed with the statement - "I / my colleagues have been inspired to deliver more STEAM / engineering-focused activities in the school": this included six who strongly agreed (60%), three who agreed (30%), and one who neither agreed nor disagreed (10%).

70% of teachers surveyed went on to state that they had already used the knowledge or information gained from the CTI activity in lesson plans or during enterprise activities in school. Some respondents provided further details on how they had done this including:

- doing the bridge activity again with different materials;
- doing 'design and make' problems;
- feeding back the description of the production facilities to learners and communicating the apprentice opportunity;
- encouraging pupils to go online to complete the careers quiz and discussing job roles in lessons;
- and discussing skills applicable to future careers.

"We will be looking at booking more events like this and seeing what else is on offer". (Primary school teacher – survey respondent)

One teacher however, noted that they had not yet had time to use the knowledge and information gained in other lessons or activities but planned to do so. The remaining two teachers noted that they didn't know or that the question was 'not applicable' to them.

Evidence collected from the survey suggests that some of the knowledge and information has been circulated to other teachers etc. 80% of teachers who responded to the survey said that they had shared any knowledge or information they gained from the CTI activity with other teachers / learning practitioners in their school. Two said that they had fed back the information in staff meetings and one said they have passed on feedback to the SLT careers link.

Forming and strengthening links between schools / colleges and industry

The evaluation findings indicate that the project has been successful in helping to form some links with industry. Almost all (90%) of teachers who responded to the survey agreed that "the CTI session / event / visit strengthened the links between my school and local industry / employers": six strongly agreed (60%), three agreed (30%) and one neither agreed nor disagreed (10%).

The benefit of creating these links was further demonstrated during an Arad visit to a primary school classroom assembly, where one teacher felt that it had been useful to develop links with EESW and other companies like this to have external specialists in the industry be able to share their knowledge and expertise with the pupils, giving them a real insight into their experience of the engineering industry and the range of careers it offers young people. *'This goes beyond what insight a teacher can give pupils and is invaluable'.*

The site visits and webinar for teachers offered direct contact between teachers and industry and created opportunities to develop further direct links between these companies and the participating schools. The in-schools sessions delivered by EESW also provided opportunities for learners to gain information and knowledge about how STEAM activities can be applied in industry from individuals who had direct contact with and experience of working with industry.

Participation in the project has also encouraged teachers to pursue other opportunities to engage in activities that further strengthen their links to industry. The majority 90% of teachers who responded to the survey noted that the CTI activities had encouraged them or their school to organise other industry linked sessions, events, or visits for teaching staff and / or learners. Examples of activities they were looking to organise included industry site visits for learners' similar to the ones attended by some of the teachers surveyed. One secondary school teacher who responded to the survey also noted that as a result of taking part in the CTI project they are now participating in the EESW STEM Cymru 2 sixth form project

Supporting the new curriculum

As noted in section 4, the design of the CTI project is relevant to areas of the new curriculum including CWRE. Teaching practitioners who responded to the survey were less clear however as to how the project supported the new Curriculum for Wales. Four of the ten survey respondents who answered this question felt that their involvement in the project helped support them and their school's planning for the new Curriculum for Wales 2022. Three out of these four were primary school teachers where who had participated in the classroom activity sessions. These activity sessions are likely to demonstrate more relevance to the new curriculum, and this was supported by the views expressed by one primary school teacher interviewed during a CTI classroom session who felt that the practical element of the session linked well with the new curriculum.

Overall satisfaction

Overall, survey results suggest that teachers were satisfied with the CTI activities they took part in with seven in ten (70%) rating the project as excellent with a further 30% (three respondents) rating it as good.

Value for money

A budget of just under £145,000 was allocated to deliver the project (£57,000 in Bridgend and £88,000 in RCT). The final costs of delivering the project fell short of this budget, resulting in a total underspend of just over £40,000 (£34,000 underspend in RCT and £6,000 in Bridgend) – see table 6.1.

This underspend largely reflects the lower than planned number of industry site visits, webinars and seminars for teachers that were delivered. As a result of cancelled industry events, lower than planned costs were incurred for room hire, translation, printing and catering. The project also experienced some delays and challenges appointing project staff resulting in fewer project deliverers than initially anticipated and therefore lower than anticipated costs for equipment including laptops, required by these deliverers.

Although, the project did not achieve all its initial aims in relation to recruiting teachers to participate in industry site visits, it did achieve, and in many cases overachieve on its delivery of in-school sessions. As noted elsewhere in this report, these sessions have been well received and generated positive outcomes. As such the project can be considered to

have provided good value for money. In addition, if barriers to teacher participation in industry events can be reduced in the future, the project has the potential to generate even better value for money.

Table 6.1 Actual project spend compared original budget.

Connecting Teachers with Industry		Original Budget	Final total cost	Actual underspend
	Bridgend	£ 56,708	£ 50,379	£ -6,328
	Rhondda Cynon Taf	£ 88,136	£ 54,147	£ -33,989

Cost per school, pupil and teacher

Overall, across both local authority areas, the CTI project delivered sessions to 2123 school pupils (1053 primary school pupils and 1070 secondary school pupils) within 40 schools. The project also enabled 134 teachers to attend industry site visits and a webinar.

The overall cost of delivering the project has been £104,500. A breakdown of these costs itemising how much was allocated to supporting teachers to attend industry site visits and how much was allocated to supporting in-school sessions, is not available. However, based on total spend figures the costs of delivering the project in relation to pupils supported has been just over £49 per pupil. This ranges from £45.50 in RCT to £54 per pupil in Bridgend. Costs per pupil can vary according to the number of learners attending each session.

Based on the same total spend figures, cost per teacher supported to attend industry visits and events averaged £780 / teacher. This has been very similar across both local authority areas with costs ranging from £775 / teacher in Bridgend to £784 / teacher in RCT. Average cost per school supported based on total spend figures has been £2,613 – ranging from £2,519 in Bridgend to £2,707 in RCT

7. Conclusions

The evaluation findings outline that the Connecting Teachers to Industry project (CTI) has generated a number of positive outcomes that contribute to strengthening the links between industry, teachers, schools and learners.

The project's initial aim was to encourage and support 328 teachers from Bridgend and Rhondda Cynon Taf to attend organised industry site visits - this was later revised to 166 teachers. These visits aimed at enabling teachers to gain first-hand experience of the way in which modern engineering and manufacturing workplaces operate.

The project successfully gathered support from a wide range of industry organisations who were prepared to support and accommodate site visits and / or participate in webinars that introduced teachers to the way in which their industry operates. However, the project encountered challenges recruiting teachers to attend these visits and webinar sessions and as a result only 125 teachers engaged in these activities. Most of these challenges related to issues such as Covid protocols and practices in schools that limited the extent to which teachers' could be released from their school duties. The challenges also related to teachers being unavailable to attend sessions due to ill health – all these challenges related to issues that were beyond the project's direct control.

The evaluation findings indicate however, that the teachers who did attend site visits benefited a great deal from them, both in terms of their own professional development and their ability to pass on the information and experiences they had gained to learners at their school or college.

In light of the challenges encountered, EESW and the two local authorities were very quick to respond and in deciding to change the project's approach by redirecting the project's underspend to deliver STEAM career presentations in schools, and hands on activities in primary schools. The evaluation findings indicate that these sessions were well received by participating schools. These sessions offered participating learners a good insight into how STEAM related skills and activities are used in industry as well as the career opportunities available to young people studying STEAM subjects.

As a result of this change in direction, the project also successfully achieved and, in most cases overachieved on its reprofiled output targets across both local authority areas. The revised target aim of the project was to engage with 38 schools (18 in Bridgend and 20 in RCT). By December 2022 the project had exceeded this target engaging with 40 schools – 20 in each of the two local authority areas.

The CTI project was intended to offer teachers and schools an introduction to activities that could develop or strengthen their links with industry – and to this end it can be considered to have succeeded. This is further supported by the evaluation findings that indicate that the in-school sessions inspired many participating teaching practitioners to pursue other activities that will further strengthen their links with industry, and knowledge of STEAM based industry. The findings also outline that those teachers who attended industry site visits sought opportunities during and after these visits to maintain contact with these companies.

Overall, the project has achieved its aim of supporting schools in Bridgend and RCT to strengthen their connection with STEAM related industries. It did not however, for reasons noted above, fully achieve its aim of connecting the total target of teachers with local

industry organisations. However, where this was achieved, the findings indicate that it generated positive benefits. Future projects of this nature should not therefore be discouraged by the challenges encountered during this pilot project, and consideration should be given to further pursue opportunities to enable teachers to gain direct experience of what local STEAM related industries do and how they operate. Consideration should also be given to continue with the in-school sessions and presentations within primary and secondary schools, either as part of the same project or as another.

Annex 1

Theory of Change Table

Input	Activities	Outputs	Performance (what's worked well)	Outcomes
<p>CRF funding</p> <p>Time of EESW staff</p>	<p>An initial focus groups to gather feedback from teachers on the CTI project proposals, and to generate new ideas to feed into the project delivery</p> <p>A series of events aimed at providing teachers with first-hand experience of the STEAM related career opportunities and the skills required to pursue these careers.</p> <p>Primary school sessions aimed at introducing learners to the practical application of STEAM related skills in industry and improving soft skills such as team working and communication</p> <p>Secondary school level event sessions providing more in-depth careers focus, on opportunities for studying STEAM at FE/HE, as well as sessions on apprenticeship opportunities and other career options.</p>	<p>Primary school teacher events arranged and delivered Measure – number of events</p> <p>Primary school teacher delegates attending events Measure – number of teachers attending</p> <p>Class based sessions delivered in primary schools Measure – number of sessions delivered / schools reached Measure – number of learners participating in sessions</p> <p>Secondary school teacher industry events arranged and delivered Measure – number of events</p> <p>Secondary school teacher delegates attending industry events</p>	<p>Participation rate of events</p> <p>Participating primary teaching practitioners feel enthused, informed and able to use the knowledge and information they gained to support learners within their school / college</p> <p>Learners feel more informed about careers and opportunities in STEAM.</p> <p>Participating industry partners consider attending events to be worthwhile</p>	<p>Short term outcomes</p> <p>Participating school and FE practitioners inform young people in schools and colleges of the career an apprenticeship opportunity that are available in the local area.</p> <p>Participating school and FE practitioners use the knowledge and information they gained from the industry related activities to illustrate in the classroom how STEAM related subjects are used in industry.</p> <p>Participating primary school learners gain an insight into how STEAM skills are used in practice and gain practical experience to further</p>

	<p>Engaging with industry representatives to encourage their participation in events</p>	<p>Measure – number of teachers attending</p> <p>STEAM related careers information sessions delivered in secondary schools</p> <p>Measure – number of assembly sessions delivered / schools reached</p> <p>Measure – number of learners participating in sessions</p> <p>Industry partners attend events</p> <p>Measure – number and type of employers involved in industry events</p>	<p>develop STEAM related skills and knowledge.</p> <p>The activities support the Continued Professional Development of participating practitioners.</p> <p>Medium / longer term outcomes</p> <p>Young people gain an insight into the education choices and career paths available to them in the future.</p> <p>More young people consider and take up apprenticeships and other career opportunities in local STEAM related industries.</p>
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Annex 2

Record of CTI Cancelled Events

The following events were arranged but later had to be cancelled due to low take up among teaching practitioners.

- University of South Wales event originally scheduled for 16 March 2022 was cancelled 3 days before the event due to low sign ups. This was later rearranged to 25th May 2022 but had to be cancelled again a few days before the event due to insufficient numbers.
- Bridgend STEAM Academy event scheduled for 4th April 2022 was cancelled due to low sign-ups.
- Sony UK Webinar scheduled for 9th April 2022 was cancelled a few days before due to low sign-ups.
- Eriez Magnetics Event Scheduled for 18th of May was postponed due to low numbers – this was rearranged again for 22nd June 2022.
- Renishaw Event organised for 26th May 2022 was cancelled due to low numbers.