**Midlothian Council**

**Lifelong Learning and Employability**

**Overview of work undertaken by service in relation to STEM**

STEM is a broad area involving many industries with specialist knowledge and facilities. It has been imperative that Midlothian Council develops partnerships with local education institutions and organisations if it is to create STEM opportunities for all within the area. For this reason, we have developed close links with Edinburgh College, Edinburgh University, The Midlothian Science Zone, Bright Green Business and other small and medium sized STEM Businesses within Midlothian. Creating pathways in STEM within Midlothian is a key priority of the DYW Board.

The following information describes this partnership work:

1. **P7 STEM Inspiration Experience jointly with Edinburgh College**

 The STEM Inspiration Experience was developed by Edinburgh College and piloted in the Midlothian area in June 2017. Edinburgh College and Midlothian Council worked in partnership to ensure local P.7 pupils were given an opportunity to engage with STEM technologies through a series of fun and informative activities during a day at college: This included:

 **SCIENCE - exploring the science of gravity and g-force, with students launching eggs attached to parachutes from height.**

 **TECHNOLOGY - the Bloodhound Rocket Car Challenge: Part of the national engagement project around the Bloodhound land speed record attempt – and microchip sensor technology to explore the mechanisms of speed

 ENGINEERING – exploring different types of bridge construction and designing and building a two-foot cardboard bridge, then testing it using a heavy car model**

 **MATHEMATICS - a classroom-based problem-solving challenge centred on how the real Bloodhound car can reach 1,000mph.**

 **Pupils are required to complete a STEM workbook prior to attendance at college. This is an exciting initiative that widens pupils knowledge and awareness of the world of STEM and the possible work within it. The programme also helps pupils in their transition to secondary school as they attend college for the day with pupils from other primaries within their high school cluster area.**

 **Lessons Learned**

 **This programme was a pilot and has been positively evaluated by pupils and schools who took part but it is too early to say if it is having a positive impact.**

 **Schools would like more notice of the opportunity – many schools could not participate in the event because their calendars were already full for the academic year so better forward planning is required in future.**

 **Data Protection procedures could be improved. A Data sharing agreement was required in sharing pupil’s information between schools and college – this took considerably longer than hoped as it was a procedure some parties were unaccustomed to.**

1. **We have attempted to run 2 further opportunities with Edinburgh College which have not had much success. These are:**

ENGINEERING ACADEMY S5/6

 Courses are delivered by trained engineers in a real life industry standard environment and offer recognised qualifications.

 There are two courses available and pupils are required to attend college two afternoons per week:

 • Engineering National 5

 • HNC in Engineering Systems with Renewables

STEM ACADEMY S4/5

 Students will develop essential knowledge and laboratory skills to prepare for employment within the growing science industries to gain a National Progression Award (SCQF Level 4) in science and technology

 **Lessons Learned**

 Despite advertising both of these opportunities within our Schools Vocational Directory and promoting to schools at every opportunity (DYW meets, correspondence, careers fairs etc.) we have encountered difficulties in recruiting sufficient numbers to these new courses. Continued promotion is required to ensure greater uptake by schools. Transport can be a factor as some high schools are a considerable distance from the Dalkeith Campus of Edinburgh College, but we are currently reviewing and looking at new ways to promote this opportunity.

1. **Edinburgh University, Easter Bush Campus (Science Park in Midlothian)**

Modern Apprenticeships (MA’s**).**  We target students aged 16-19 years for our Modern Apprenticeships at Easter Bush Campus which hosts MA’s in IT Customer Service, Business Administration, Equine (Stable Hands), Digital Communication and an “apprentice style placement” scheme for veterinary nurses. A further five MAs will be on offer in: Stores, Quality Management, Accounting, Pathology and Research Imaging.

1. **Career Ready Mentorships**

 Easter Bush Campus participate in the Career Ready Scheme in Midlothian, offering 5 placements per year. This is a 2 year mentoring programme, which includes a 4 week paid work placement for students entering 4th year at high school who primarily come from underprivileged backgrounds or from areas of the county with high deprivation levels.

1. **Science Insights Work Experience Programme**

 Science Insights is an exciting annual work experience programme designed to give

 5th year high school pupils a real insight into the work of research scientists. It is

 run by five research Institutes from the College of Medicine and Veterinary Medicine at the University of Edinburgh. Forty places are offered to high school pupils who spend a week of their summer holidays on four different University of Edinburgh campuses, gaining a real insight into bioscience research. Programmed activities include shadowing researchers in the lab, tours of a range of scientific facilities, presentations and discussions on a range of topics including ethics in research, the use of animals in research and careers in science, opportunities to meet current University of Edinburgh students and skills sessions to help with future university and job applications.

1. **Free Massive Open Online Courses (MOOC’s)**

 (MOOCS) from the University of Edinburgh are on offer in Veterinary Science, Animal Behaviour & Welfare, Equine Nutrition, Astrobiology & The Search for Extraterrestrial Life, Introduction to Programming etc. Easter Bush Youth Forum provides emotional and educational support for all 16-28 year olds working or studying at Easter Bush Campus. Staff and students from Easter Bush Campus are available to visit schools for careers fairs/events via the STEM Ambassador scheme. Staff on campus also offer CPD to teaching staff in partnership with the Scottish Schools Education Research Centre (SSERC).

 We have identified an issue with local people applying for and accessing jobs at the Science Park and are working to raise awareness of the range of opportunities available and allow adult returners the chance to learn more about specific occupations on offer. Our adult learning programme offers supported MOOC’s for adult returners in a group work setting. These are free of charge although there is a small charge if you wish to receive the certificate. One of the MOOC’s on offer next term is Animal Handling. It is too early to evaluate whether or not this has made a difference.

1. **Schools Outreach Programmes**

 The Roslin Institute (based at the University of Edinburgh’s Easter Bush Campus) have recently delivered outreach sessions to primary schools to engage with science - “DNA, Dolly and You” workshop to two classes (P6 and P7) have been delivered at Stobhill Primary School and it is hoped other primaries can participate in future.

 The Roslin Innovation Centre will be completed in October 2017 and will contain lab space for 30 pupils to participate in workshops and lessons. A series of meetings has been held with schools, staff from the Roslin Institute and Midlothian Council to develop an enhanced STEM programme for pupils to attend and utilise the lab space to complement the school curriculum. Whilst we have been able to explore what areas of study could be focused on within the lab, we have found the logistics and expense of getting schools to visit the lab space on a regular basis a barrier. We are hoping to ensure schools can visit once or twice per term and/or alternatively that teachers visit the lab space and participate in CPD sessions which they can then take back to their respective schools and classes.

 **Lessons learnt from partnership work with Edinburgh University**

 In working collaboratively with Edinburgh University, we have been able to help promote these opportunities to schools and pupils within Midlothian. Whilst we feel we could ensure greater uptake of these opportunities by schools and pupils, progress has been made in the last year to promote the opportunities and increase further uptake by schools. This has been achieved by publishing opportunities in our annual STEM booklet for schools (copy attached), promotion at school career fairs and also at DYW and work experience meets with schools. Our STEM Co-ordinator, Grant McGowan, has attended our schools to promote and assist pupils with the application process for these opportunities to ensure greater uptake. Transport has been an issue to the Easter Bush Campus, but we have allocated funds to assist pupils to get to the campus and participate in activities there.

 Edinburgh University have been very supportive of us delivering their MOOC’s to adult returners outwith the scheduled programme and in a groupwork setting which suits some adult learners better as they get support from peers and tutors.

1. **Midlothian Science Festival Partnership**

 Midlothian Science Festival runs every October offering a full programme of talks, workshops and fun activities for young people, adults and families. Midlothian Council offers funding for the festival, staff time and use of Council buildings, particularly Libraries, and supports the festival in any way it can. This work has helped to bring companies, schools and the Council together to jointly plan, organise and deliver the festival every year. We timetable a week of events within schools during the Festival.

 Funding is the main issue with the Festival. For this reason we hope to bring more sponsorship in for the festival from the Midlothian Science Zone and to continue to donate council services, facilities and funds if possible.

 Our library service offer a wide range of coding clubs and lego clubs for children which are very popular and run largely by volunteers. We are currently developing a training programme to recruit Coding volunteers to allow these clubs to continue.

1. **Bright Green Business Partnership**

 BGBP are a member of our DYW board and we work in partnership to promote their programmes to schools and employers. These include:

 **The STEM Challenge** - A half day workshop led by local employers to motivate young people to take up STEM subjects. These workshops are hands-on creative challenges which highlight the skills gained in STEM subjects and how these translate into the workplace.

 **Physical Physics** - A family learning experience designed to incorporate priority areas of STEM and the gender imbalance in this sector. An interactive workshop sets challenges while Industry representatives give pupils and their families the opportunity to learn more about emerging industries.

 **Business Mentoring** - Our year long mentoring programme help pupils secure positive destinations ahead of leaving school. This year we have a wide variety of participating organisations including EDF energy, Zero Waste Scotland and Scottish Forest Enterprise who all play an active role in promoting STEM for young people.

 Midlothian’s positive destinations figures have vastly improved over the past 5 years, with the Authority moving from 31st place to 7th.

1. **Lifelong Learning & Employability (LLE)**

 **S6 MY-JET (STEM) Programmes**

 Across Midlothian, LLE offer 18 work placements for S6 pupils to work within the STEM Industries. Students are offered the opportunity to work one day or half day per week around their school timetable to give first-hand experience of working in a role they are interested in pursuing. Previous pupils have worked within the NHS, Midlothian Science Zone and local veterinary practices.

 **Lessons Learned:**

 We have found that participants can bolster their UCAS and college applications for future study. The programme can help students to decide upon which career or course of study they wish to pursue. We cannot guarantee placements for all students who enrol as we are in competition for work placements with university students and can find that some of the organisations within the Midlothian Science Zone are not always open to receiving work placements from students still at school.

 **STEM Stall at all Midlothian High School and Adult Careers Fairs**

 During the 2016/17 academic year we piloted a STEM stall for parents and students at our school and adult Career Fairs. This allowed Midlothian Council to highlight and promote all STEM opportunities for young people and adults. We also recruited STEM Ambassadors in each area to attend the STEM stall at all careers nights.

 **Lessons Learned**

 Having our very own STEM stall at all Midlothian Career Events really helped to promote STEM opportunities to all within Midlothian. Recruiting STEM Ambassadors has allowed parents and young people to speak to industry insiders regarding a possible STEM career to inspire the next generation of young people to enter the diverse industry. It also allowed STEM companies to promote their companies and any opportunities they had for employment (i.e. Modern Apprenticeships, Internships, Graduate programmes etc.). This will be continued for the 2017/18 Academic Year.

 **European Computer Driving Licence and IT Classes**

 Our LLE team deliver the ECDL course across Midlothian to help adults brush up on their IT skills to bolster IT literacy, confidence and job prospects. We have found it important to allow participants flexible IT access so they can work through the award at their own pace and timetable (i.e. around school hours, caring duties or working arrangements). We have staff on hand at our IT suites to assist participants and support them through the process. This is a very popular course as is PC Passport, both of these are offered on our fee paying adult learning programme. We offer a range of free Digital Skills for Life and Work courses on our community based adult learning programme which allows people to develop their IT skills and use their own mobile devices.

 **Learning Pathways**

 We offer a number of learning pathways to young people aged 15 to 20 years who have disengaged from mainstream education. These pathways run for 39 weeks throughout the year and offer young people a chance to increase their skills and qualification in a sector of interest. Two new STEM related pathways which are due to start in August 17 are Admin & IT and Small Animal Care (Leaflet attached).

 **Schools Vocational Programmes**

 LLE offers all Midlothian High Schools an opportunity to participate in Construction related training and qualifications. The opportunity is open to S2 to S4 pupils (male & female) and also an opportunity for a dedicated ‘Girl’s only’ group to try to encourage younger females into a Construction related career. All groups are normally with us for half a day per week over the full school year and can potentially participate over three years as some schools are now adopting this as a subject choice. S2 pupils will work on construction related projects leading to accredited qualifications in year 3 and 4 should they wish to continue. All qualifications have embedded opportunities for Core Skills SQA qualifications including Numeracy, Literacy and Personal Development while also working on social and inter personal skills and team work. This programme will equip young people with the basic skills to progress in the industry.

 **Lesson Learned**

 LLE need to work more closely with schools at initial referral stage. This will help ensure that the most suitable pupils are referred onto the programme. Also it is essential that pupils are made aware at an early stage of the requirement for academic qualifications in order to enter and progress in the industry.

 **Impact:**

 The vocational programmes were attended by around 114 Midlothian High School pupils. 14 of which were a girls only Pilot Programme which turned out to be very successful and will run again in the next school year and will introduce accredited qualifications delivered to the group. The majority of the pupils stayed on at school. 3 left school and have moved on to construction related college places. 92 Skills for Work Qualifications in Construction areas were achieved by S3/4 groups at Nat 4 level. 24 SQA qualifications were achieved by S2, s in Cycle Safety and Maintenance.

 **Employability Fund Stage 3/ Aim High Construction Groups**

 Employability Fund programmes are funded by SDS and the Aim High Programme is local authority funded although the delivery method is mirrored in both. These are both 13 week programmes covering 30 hrs per week although hours will increase when young people carry out the work placement element. Candidates on these programmes receive a training allowance and support with travel costs if they meet the eligibility criteria. The programmes are heavily focussed on accredited qualifications as by the end of these programmes a young person should potentially be job ready. The focus here is on Construction but also covers Employability, Personal Development and Health and Safety. All areas are accredited by SQA units. For 6 of the 13 weeks each candidate is placed with a suitable employer to demonstrate their readiness for employability and will be given an opportunity of employment. Ongoing support is offered throughout these programmes and beyond.

 Impact:

 We are currently in a new contract year for Employability Fund so at this point it is still too early to provide information on outcomes regarding Positive Destinations or Qualifications. Aim High groups had 22 starts and from this around 50% went on to FE or full time employment and all achieved a minimum of 12 SCQF points at accreditation stages at level 4/5.

 **Lessons Learnt**

 As with other programmes the biggest issue is that young people are being referred to these programmes before they are ready so in a way have been set up to fail. This becomes most apparent when being placed with employers as the main reason given for rejection is that their timekeeping and attendance is not acceptable. Employers do not have the time or patience to deal with this as they want work ready young people.

 **Adult Learning Programme**

We run a paid programme which traditionally offered programmes in arts and creativity, IT, social sciences, leisure and health and wellbeing subjects. We also offered some Highers in Mathematics and Human Biology. Over the past 2 years we have been working to deliver a wider range of opportunities which lead to qualifications and accreditation including specific sector related subjects. This year we are offering PC Passport, Creative Computing, Mathematics Higher and Nat 4/5 (Lifeskills Maths), Human Biology Higher, Introduction to Engineering and Bike maintenance programmes. All of these programmes are evaluated positively with 95% of participants rating the service as very good or excellent.

 We also run a large free programme in local community facilities which includes a wide range of IT from basic IT skills for life to digital photography and MOOC’s. Last year we revamped our IT programme to offer free courses in Digital Skills for Life and Digital Skills for Work. These provide an excellent first step back into learning and IT and are in demand from a wide range of adults. We also deliver a wide range of SQA qualifications in numeracy at levels 2 to 4. We ran a family learning opportunity in Coding during the summer holidays which was well attended and successful. Many children and young people went on to join local library coding clubs as a result of this and continue to increase their knowledge and skills. We are also planning on running a training opportunity for people who would like to volunteer in our coding clubs to develop their skills and capacity.

 **Conclusion**

Some of our work in STEM is still at the early stages of development but we are making good inroads in raising awareness, increasing uptake and developing STEM skills with young people and adults. This is a key priority area moving forward for the Council.

 Karen McGowan

 LLE Officer