**ABSTRACT**

Science, Technology, Engineering, and Maths (STEM) is an integral part of the world we live in, from how we live our lives to the jobs we work in, and the importance of STEM is only growing. It is nearly impossible to think of any aspect of our life that is not influenced either directly or indirectly by STEM, from our health to the technology that we have become so reliant on. STEM industries are the fastest growing in the world with all major economies involved in their development and expansion. It is also a major focus of the Scottish Government to develop and build its STEM capabilities to continue to compete as a world leader in science and engineering. The Scottish Government is committed to supporting young people into STEM careers along with developing STEM capital within families and their communities. This has led to an increased focus in education to lay down suitable knowledge at the Broad General Education (BGE) phase of education. Schools have been looking to increase the numbers of pupils continuing their STEM education into the Senior phase of their schooling and beyond into further and higher education. However, despite this focus, there are still many perceived barriers to entering STEM, indeed, even the question of what STEM is has still to be answered. Those involved in the development and delivery of STEM education have not been able to come to a consensus as to what STEM education means or what it looks like with some looking at it as distinct disciplines and others as only becoming STEM when disciplines are integrated. The inequity in STEM representation in gender, ethnicity and deprivation begins in early education and must be addressed. These barriers must be broken down through the development of robust educational programs to allow all young people to develop the necessary skills to take their place in the modern workforce and contribute to modern society

This study used a mixed methodology to understand the impact targeted STEM opportunities have on pupils’ attitudes towards STEM. This study used class and extracurricular project-based STEM learning to look at whether participation in STEM projects would change the way pupils view STEM and their future involvement in it. This methodology was chosen as literature had shown that participation in STEM out with a pupil’s normal curricular experience and exposure to diverse role models made pupils view STEM more positively. Questionnaires were used to gather quantitative and qualitative data both pre- and post-intervention. This was then analysed to identify any changes in the way pupils viewed who could work in STEM, STEM education, and STEM careers. Interviews were also carried out post-intervention to gain a more personal view of project-based learning and its impacts.

The study did not find that participation in targeted STEM opportunities had an impact on the attitudes pupils held towards STEM, however, it did show that working within a team on a project helped pupils develop their soft skills such as teamwork, communication, problem solving and conflict resolution. The extra-curricular projects also showed the importance of exposure to role models, the positive impact on confidence this can have and identifying novel opportunities in careers they may not have considered. While this study did not have an impact on pupils’ attitudes towards STEM future studies may wish to revisit project-based learning with projects which start earlier in the year, are carried out over a longer period, and involve a larger cohort. Developing networks of contacts to act as role models and mentors to pupils would also be advantageous.