

**Final Evaluation  
of the  
Science Skills Academy**

**Executive Summary**

**For**

**Highlands and Islands Enterprise**

**February 2024**



## Context

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The Highland area and the wider Highlands and Islands region has skills shortages in STEM and STEM occupations can be hard to fill. There are also widespread concerns about the future supply of well-qualified and highly skilled STEM professionals and the impact this could have on economic growth and resilience. STEM skills are increasingly important, and will be vital to supporting growth in sectors such as Life Sciences and Renewable Energy, which are key priorities in the Scottish Government's National Strategy for Economic Transformation (NSET).

## The SSA project

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The Science Skills Academy (SSA) project was created in response to a major growth in STEM related industries forecast to impact on the Highlands and Islands economy over the next decade. The aim of the project is to encourage more young people to study STEM in school and beyond, develop STEM skillsets and raise awareness of STEM careers. This aim is intended to increase the proportion of young people engaged in STEM, raise their levels of attainment in these disciplines and raise the awareness in pupils, parents, carers, and teachers about the current and expected availability and appeal of STEM-related careers.

**The non-traditional mode of delivery is a key strength and USP for the SSA**

The SSA has been delivered through a collaborative partnership approach, supported by funding from the Inverness and Highland City Region Deal. It has established a network of Newton Rooms across the Highland area, with locations in Inverness, Dingwall, Fort William, and Thurso. These are supported by a mobile pop-up Newton Room. The Newton Room concept is owned, developed and managed by the non-profit foundation FIRST

Scandinavia. The long-term goal of the Newton Rooms is to inspire more young people to become interested in STEM subjects and encourage them to study these subjects in school and beyond through high quality, hands-on science-based activities.

## SSA delivery and impacts

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Despite delays experienced at the outset of the project, and significant disruption as a result of the COVID-19 pandemic, the SSA project has performed well against many of its business case targets. From inception in 2017 to the end of March 2023, the SSA project team have delivered 1,146 sessions across the Highland Council area. A total of 21,982 engagements were delivered during this period. As of December 2023, SSA engagements total more than 25,000. Overall, the SSA project has engaged with 94% of schools in the Highlands. When schools without P6/P7 pupils and schools that have recently closed are excluded from the total, this rises to 98%.

This is significant reach for the project. The pop-up Newton Room has proved particularly effective in overcoming geographical barriers for more rural and remote schools.

**The SSA has achieved significant reach, with 94% of schools engaged, and a total of 21,982 engagements to March 2023. Engagements are currently above 25,000 (December 2023)**

**The SSA is an inspirational setting that delivers a significant learning opportunity for Highland pupils**

A key principle of the SSA project is providing hands-on engagement in a live STEM environment. This non-traditional mode of delivery is a key strength, and a USP for the SSA project. The SSA takes a 'whole class' approach in its delivery, meaning that there are no barriers to attendance, and no 'self-selection' where some pupils may be more likely to attend than others – making a positive contribution to inclusion and equity of access to STEM sessions. Engagement with pupils across year groups at primary and secondary schools is also important for maintaining engagement with STEM learning. The use of

social capital in delivery and anchoring of delivery in a local context has helped to create better awareness of local industry within schools, as well as promoting STEM careers in Highland.

Throughout its delivery, the SSA project team and 'frontline' Newton Room teaching staff have been held in high regard. They are considered by stakeholders, teachers and STEM practitioners to be a significantly valuable asset for the SSA project. The team's approach to relationship-building and in-depth engagement, and the high degree of personal contact and support contributes to the excellent reputation the SSA has within Highland. Consequently, the SSA project is considered a vital component of wider STEM education delivery across Highland.

**The majority of pupils rated their SSA experience very positively, and also thought that SSA activities made learning easier**

There is evident demand for extra-curricular STEM activity to bolster in-class STEM education. The SSA project is well-placed to respond to this demand, and is seen by stakeholders and schools alike as a key resource for STEM education. As such, there is a strong rationale for its continuation.

Students and teachers are very positive about their experience of the SSA. Pupils consider the Newton Room an inspirational setting. Their experience has increased interest and awareness in STEM, and has also increased pupils' keenness to study STEM subjects at school. Many pupils that have attended the SSA consider that it has enhanced their classroom learning. Pupils of all ages demonstrate considerable learning through their SSA experience. Following their SSA experience, pupils were typically more confident in their own STEM abilities, more engaged in STEM learning, and more likely to enjoy the STEM topics covered in school. Most pupils, whether primary or secondary, had a better understanding of what STEM is and what jobs are out there following their Newton Room experience. There is also evidence that pupils are more likely to study STEM subjects after school. Therefore, it can be argued that the SSA is 'shifting the dial' in terms of appetite to continue with STEM education, and pursue STEM employment pathways in future. Ensuring greater links with local employers will contribute to achieving longer term impacts and outcomes regarding STEM education and employment amongst pupils.

**Three quarters of pupils feel that practical activities at the SSA made learning more enjoyable. Primary pupils in particular enjoyed learning new things**

Teachers overwhelmingly considered the experience as exciting, inspirational and informative for their pupils, and also found the Newton Room inspirational for them. They also valued the teaching approach of the SSA. Teacher consensus is that the SSA sessions help to kickstart pupils' STEM career thinking and planning on future education and career pathways.

**Teachers are overwhelmingly positive about their SSA experience, and agreed that SSA activities were well organised and resourced**

The SSA and Newton Rooms are viewed more positively by teachers compared to other offers available to Highland schools. Additionally, the SSA and Newton Rooms are considered as more inspirational for learning, and as a vehicle to inspire pupils to pursue further STEM education. Teachers are more motivated and reinvigorated by their SSA Newton Room experience, reporting increased confidence and capability with regard to their STEM teaching. However, some teachers noted that they are still constrained by the school resources available to them.

The SSA delivers a range of strategic benefits as well as impacts for pupils and teachers. It has added capacity to the Highlands and Islands STEM Partnership and provides a co-ordination role which is beneficial to the strategic development of STEM in the region, leveraging support from the Glasgow Science Centre and engaging major employers. Crucially, the HIE-led SSA team is considered a key strategic partner by other STEM actors in the region.

**The SSA is a vital partner and contributor to the Highlands and Islands STEM Partnership**

## Conclusions and future considerations

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In the context of a complex STEM education and learning landscape in Highland, and ever-increasing importance of STEM skills to support economic transformation and a Just Transition, the Science Skills Academy (SSA) has been successful in delivering against its stated objectives. SSA delivery is well-aligned with other STEM activity in Highland. It demonstrates strong complementarity with other offers. It also supports delivery of the Curriculum for Excellence (CfE).

There is a clear and strong rationale for the SSA's continuation. There continues to be high demand for access to additional STEM learning and outreach opportunities to augment in-class teaching and learning. There is also an aligned issue with the continued engagement of pupils as they transition from primary to secondary education and progress through the BGE phase. The SSA project is well-placed to respond to the evident demand and challenges regarding STEM engagement. If the SSA ceases delivery, a significant resource will be lost and there will be a sizeable gap in its absence. Despite there being a number of other STEM offers available in Highland, none are sufficiently resourced to meet the same level of demand, and are unlikely to be able to scale up quickly enough – particularly in a prolonged period of financial constraint.

A set of critical success factors that are key to the success of the SSA have been identified, and should be integral to any future SSA provision. These are:

- High quality equipment and facilities that fill the gaps in what is available to schools;
- Skilled and enthusiastic staff deliver hands-on, practical activities;
- Application of the principles of collaborative learning;
- Proactive barrier removal to maximise participation e.g. cost, and transport;
- Alignment with CfE and provision of materials to support teachers to deliver the curriculum;
- Taking a 'whole class' approach so there is no selection or self-selection;
- Ability to take the Newton Room to where the schools and pupils are, through the pop-up;
- Creation of an inspiring, motivating and dynamic learning environment;
- Demonstration of how STEM subjects link to industry, occupations and careers;
- Modules that reflect industry opportunities;
- Activities and topics that are tailored to the local context;
- Industry engagement in developing and as appropriate, delivering activities;
- Active participation in strategic partnerships in the Highlands and Islands, and as relevant nationally; and
- Proactive monitoring and evaluation of process, delivery, outputs and outcomes.

Nevertheless, there are a number of factors for consideration with regard to future delivery, to maximise the ongoing impact of the SSA:

- **Consideration 1:** Optimise use of SSA facilities throughout the year, and particularly outside of school hours and term time to enhance its impact and attractiveness to funders.
- **Consideration 2:** Extend the SSA reach through technology, using online sessions to complement the hands-on Newton Room sessions and underpin and reinforce face-to-face learning.
- **Consideration 3:** Identifying ways for SSA participation to be counted as CPD for STEM teachers and practitioners.
- **Consideration 4:** Extending the number and range of industry partnerships, through activity and session provision, and potentially through the involvement of industry in the SSA's funding strategy.
- **Consideration 5:** Building the SSA's strategic offer and strategic influence, so that its strategic added value can be enhanced and capitalised upon.

- **Consideration 6:** Continuing to offer an evolving programme of modules and activities aligned with the current and emerging context, to keep the SSA fresh and closely aligned with developments in the local and regional economy.
- **Consideration 7:** Developing an approach to capturing impacts over the longer term, particularly in light of the limited current evidence on STEM engagement and attainment amongst learners.
- **Consideration 8:** Monitoring Scottish and UK policy developments in an evolving STEM landscape, so that the SSA is able to proactively respond to emerging opportunities.
- **Consideration 9:** Widening geographic coverage to the whole of the Highlands and Islands in future delivery, to increase the SSA's reach and influence.