STEAM in Youth Work Support Services

Report on a final evaluation survey

December 2020

National Youth Council of Ireland

The National Youth Council of Ireland (NYCI) is the representative body for voluntary youth organisations in Ireland. We use our collective experience to act on issues that impact on young people.

This is an evaluation report on NYCI's STEAM in Youth Work project. This project aims to build the capacity of youth work organisations to use STEAM to improve the lives of young people. It is funded by the Science Foundation of Ireland. This report was researched and written by Sinéad Begley and Associates.

Executive Summary

The National Youth Council of Ireland (NYCI) is the representative body for voluntary youth organisations in Ireland, which functions to represent the interests of young people and youth organisations. NYCI coordinates a Science, Technology, Engineering, Arts and Mathematics (STEAM) in Youth Work programme, the objectives of which include transforming the capacity of the youth work sector to:

- Use STEAM to support the achievement of youth work outcomes.
- Deliver inspiring, experiential STEAM education and engagement projects.

The STEAM in Youth Work Programme is delivered in collaboration with NYCI's Youth Arts and Development Education programmes. Through the programme NYCI is pioneering innovative youth work practice to encourage the development of a range of competencies using a fusion of scientific and arts methodologies. The programme also aims to enhance and promote informal STEAM engagement to young people in youth work settings. The NYCI STEAM in Youth Work programme is mainly funded by Science Foundation Ireland under the Discover Funding Programme, which welcomes novel approaches to engaging the public in STEAM, in ways that are most suited to them.

NYCI's STEAM in Youth Work Programme provides a range of capacity building support services to those working in youth work, Youthreach and other non-formal education settings including continuous professional development (CPD), resources, project payments for equipment and Scientist in Youth Work residencies.

Supporting the development of competencies to integrate STEAM into youth work can support the achievement of youth work outcomes and connect young people with STEAM in an enjoyable, experiential way. The process of positive engagement in enjoyable, hands-on STEAM activities involving trial and error, has the potential to build confidence and resilience and support young people's personal development. Youth workers have established relationships with young people and the skills to facilitate flexible, youth-led engagement that is focussed on young people's needs. Young people are enabled to connect with STEAM in a safe and familiar setting that affords the time to explore and engage in hands-on, inquiry-based STEAM in a way that is not tied to exams or assessment.

Research shows that social inequalities relating to class, gender, ethnicity, and opportunities to feel connected to, and do well in STEM, are key factors that influence young people's science identity and aspirations (Archer, Moote, MacLeod, Francis, DeWitt, 2020). The study found no lack of aspiration on the young people's part

regardless of background. This highlights the contribution that organisations that work with young people, particularly those facing challenges, inequalities, and disadvantages, can make to offering access to STEAM engagement, outside of traditional STEAM settings such as galleries, museums, or formal education.

The STEM Education Policy Statement 2017-2026 (Department of Education and Skills, 2017) recognises the importance of STEM learning in environments outside of the classroom where young people can apply STEM concepts and develop skills including curiosity, inquiry, problem-solving, creativity, ethical behaviour, confidence, persistence, and collaboration. Integration of arts-based practice with STEM provides additional channels for development of these skills and broadens the appeal to a wider cohort of youth workers and young people.

The development of transferable or 21st century skills, such as communication, collaboration and problem-solving, supports young people's development and has value beyond the study of the STEAM disciplines. These skills can be applied in everyday life, and later on, in work. Scientific literacy supports youth work outcomes and is of value in negotiating the modern world. It can enable young people to better understand issues facing society, such as the pandemic or climate crisis, and actively participate as citizens.

Since 2017, 298 youth workers and other non-formal and alternative education practitioners have availed of NYCI's STEAM in Youth Work support services. The projects supported through the various opportunities provided by NYCI address a diverse range of topics, including, for example, pinhole photography and light, electronics, robotics, sustainability, coding, ecology and botanical art, space, and the universe.

In conducting the evaluation survey, NYCI wished to ascertain the impact of the support services on youth work and STEAM practice, the policy and practice of youth work organisations and the nature of practice that was enabled by the supports. NYCI was also interested in the views of those that availed of the services on the quality and efficacy of the supports, the perceived benefits for young people and the enablers and barriers they face in delivering STEAM.

During 2020, the COVID-19 pandemic and resulting public health restrictions had a severe impact on service delivery across the youth work sector, and on young people, particularly the vulnerable. Despite the incredibly significant challenge the pandemic presented in implementing STEAM in youth work practice, 57% of respondents reported that they had already (between October 2019 and October 2020) applied the learning from the NYCI CPD, which is remarkable in itself. Respondents engaged 1900 young people in communities across the country in a variety of settings including youth clubs and Youthreach projects, homework clubs, Direct Provision, Garda Diversion projects, mental health, and family support projects.

It is notable that a large proportion of respondents (61%) work with young people who are disadvantaged or face challenges and may be otherwise underserved in terms of access and opportunities to engage with STEAM. Previous NYCI programme evaluation surveys (NYCI, 2020) highlight the nature of the challenges faced, which include learning difficulties, racism, and discrimination, living in direct provision centres, addiction issues, living in socially isolated areas with poor infrastructure, living in temporary accommodation, or being early school leavers.

Respondents rated the quality of the supports highly and feedback indicates that availing of the supports enabled them to include engaging, interactive STEAM activities in their youth work practice to deliver projects that young people really enjoyed. The CPD modelled appealing, practical, replicable, inquiry-based approaches and enhanced practitioners' STEAM knowledge, skills, and confidence.

The majority of respondents that were able to apply learning, despite the pandemic, are using STEAM more often, for longer, in more inquiry-based ways and are also applying learning in other non-STEAM related contexts. This is giving more young people access to a diverse range of engaging, hands-on STEAM activities from weaving to robotics, electronics, photography, and ecology fieldwork. Some respondents also reflected on how their organisations are beginning to embed STEAM in their programmes, and there is an opportunity to support this development further.

Respondents that applied their enhanced STEAM in youth work practice perceived a range of benefits for the young people with whom they work including positive changes in terms of the young people's self-confidence and perceptions of their own ability, and an increase in access and opportunities for STEAM engagement. STEAM activities also supported development of a range of transferable skills such as creativity, problem solving, teamwork and communication.

The majority of respondents have plans to provide access to engaging, out-of-school STEAM activities and projects in youth work settings in 2021. 72%, that provided details, estimate that between October 2020 and October 2021 they will support 3,875 young people from diverse communities around Ireland, to learn and explore by engaging in STEAM projects and activities.

NYCI can continue to support youth workers and other non-formal and alternative education practitioners to enhance their practice through inclusion of STEAM by continuing to provide a holistic suite of supports including funding, CPD, practice sharing opportunities and access to STEAM practitioners at local level for collaboration in delivery of projects.

There is potential for NYCI to engage with other stakeholders in the STEAM engagement and education space to connect the youth work sector with STEAM practitioners with a view to collaboration, similar to the NYCI/Camara partnership that delivered the NYCI TechSpace STEAM in Youth Work Maker project. NYCI can also promote opportunities for informal STEAM engagement presented by National STEM Weeks, events, and festivals for appealing and achievable STEAM engagement. Similarly, STEAM education and public engagement stakeholders could learn from the practice, skill, and experience of the youth work sector in terms of facilitating young people to engage in STEAM in meaningful ways and reaching a diverse audience.

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1. Introduction

The acronyms STEM and STEAM are both used in this report. **STEM** refers to science, technology, engineering and mathematics**. STEAM** also includes an art element, and refers to science, technology, engineering, art and mathematics. STEAM is used predominantly in this report. STEM is used when referring to research or programmes, which relate to science, technology, engineering and mathematics only.

Background

The National Youth Council of Ireland (NYCI) is the representative body for voluntary youth organisations in Ireland and functions to represent the interests of young people and youth organisations. NYCI's role is recognised in legislation (Youth Work Act) and as a social partner. The NYCI aims, through its member organisations and representative role, to empower young people to participate in society as fulfilled confident individuals. The work of NYCI is based on principles of equality, social justice, and equal participation for all. In achieving these aims the NYCI seeks the emergence of a society in which young people are valued citizens who can make a meaningful contribution to their community.

NYCI STEAM in Youth Work Programme

NYCI coordinates a Science, Technology, Engineering, Arts and Mathematics (STEAM) in Youth Work programme. The programme objectives include transforming the capacity of the youth work sector to:

- Use STEAM to support the achievement of youth work outcomes.
- Deliver inspiring, experiential STEAM education and engagement projects.

The NYCI STEAM in Youth Work programme is mainly funded by Science Foundation Ireland under the Discover Funding Programme[1], which welcomes novel approaches to engaging the public in STEAM, in ways that are most

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[1] SFI Discover Funding programme: It is part of SFI's role to grow the communities contributing to Science, Technology, Engineering and Maths (STEM) and to empower people to shape Ireland's future through innovation. Science Foundation Ireland welcomes contributions from across the sciences, arts, media, education, youth and/or community work sectors. Applicants are encouraged to submit proposals that create opportunities for broader participation and engagement of the public with STEM. Science Foundation Ireland is keen to push the boundaries of participation and welcomes novel approaches to engaging the public, in ways that are most suited to them. https://www.sfi.ie/engagement/sfi-discover/ (Accessed 15.12.2020)

suited to them. The funding call supports the application of STEM engagement and awareness in innovative ways to support youth and community work outcomes.

The rationale for using STEAM in youth work practice to engage young people

Collaboration by youth work and STEAM practitioners, and organisations can have mutual benefits in meeting the objectives of both groups of stakeholders in supporting young people. From a youth work perspective STEAM projects can offer fresh, exciting, and appealing opportunities to engage young people and support their development. Youth work organisations are expert at facilitating youth-led engagement in a safe, familiar setting, which can connect young people to informal STEAM outside of traditional settings such as galleries, museums, schools or third level institutions.

Research relating to barriers to STEM engagement demonstrates the impact of socio-economic factors and highlights the contribution that youth work organisations can make, particularly in the context of engaging with young people who are affected by inequality or disadvantage and are underserved in terms of STEAM engagement. The ASPIRES 2 Study (Archer, Moote, MacLeod, Francis, DeWitt, 2020) which focusses on understanding and increasing STEM participation, looked at how and why young people come to see science as being 'for me', or not. The study did not identify a lack of aspiration among young people; the majority aspired to university and professional careers, irrespective of their backgrounds. Key factors identified as shaping young people's science identities and aspirations include capital-related inequalities, dominant representations of science and educational factors and practices. The study found that these factors are:

> Very heavily influenced by existing social inequalities such as class, gender and ethnicity, and by whether a young person has had opportunities to experience, do well in, feel connected with, be recognised in, and continue with STEM. (Archer, Moote, MacLeod, Francis, DeWitt, 2020, p. 12)

The NYCI TechSpace STEAM in Youth Work Maker Project (2017 – 2018) was a maker project delivered in a youth work setting by the NYCI in partnership with Camara Education Ireland. The project brought together the partners' collective expertise and experience, in terms of the support needs of the youth work sector, and technology, to deliver relevant, engaging, hands-on STEM activities in youth work settings. The recent report from the project (NYCI, 2019) concluded that the approach enhanced youth work in unique ways, by providing a tool to engage young people that may not engage with other approaches such as sport or music. The report also highlighted that, while the Irish youth work sector is enthusiastically using STEM to engage young people who are under-represented, capacity issues remain a barrier and there is further potential in this regard.

Through increased recognition of STEM in youth work, and enhanced support by capacity building organisations, formal education and relevant local and national statutory agencies, the unique role of youth work in this area could be further harnessed. This could lead to great benefits for young people as well as our wider society and economy. (NYCI, 2019, p. 3)

The project identified the role that the youth work sector has to play in addressing key challenges by providing approaches that are relevant, practical, hands-on and capture the imagination, where mistakes provide valuable learning and change young people's perceptions about STEM and STEM professions. The sector is well placed to engage young people from groups and backgrounds that are under-represented in further/higher STEM education and professions, for example, girls and young people who are at risk of educational disadvantage.

The value of using science, in a similar way as using other stimuli such as sport or art, to engage and support disadvantaged young people's development (identified by the NYCI TechSpace project) was also explored by the Curiosity funding partnership between Wellcome and BBC Children in Need. The partners aimed to improve disadvantaged young people's lives through supporting increased use of informal science learning by voluntary and community sector organisations. The partners found that using science in youth work practice can support the achievement of youth work objectives through offering engaging content and opportunities for youth-led approaches and independent learning:

It would appear that science not only offers a new stimulus for thinking about and designing youth activities, but it has also begun to influence youth work practice among some delivery staff: facilitating an even more youth-led approach by encouraging staff to stand back more and leave young people to get on with the activities themselves, with less hands-on support than usual. (Wellcome, 2019, p. 41)

The project partners found that the skills and approaches needed to engage young people in any developmental activity were similar to those used to engage them with science. Critical success factors identified by the project for engaging young people in science, which youth work offers, include facilitation, youth leadership, personal curiosity, exploration, hands-on activities, variety, and flexibility.

The principles of youth work are inherently exploratory and facilitative, so staff have delivered activities where they and the young people have explored and learned together…we heard reports from the ISL partners that they had learned new ways to work with young people as a result. (Wellcome, 2019, p. 40)

At European level, the importance of STEAM and digital technologies is increasingly being recognised within youth work policy and practice. In 2019 the Council of European Youth Ministers adopted the Council of the European Union's Conclusions on Digital Youth Work, which identifies the importance of digital literacy and transferable skills for young people:

Digital literacy and other 21st-century skills play a crucial role in young people's independence, social inclusion, employability and daily lives. Young people have diverse competences enabling them to operate in a digitalised environment. However, all young people will need an agile, flexible and critical

approach to digital technology in their future work and everyday lives. (Council of the European Union, 2019, p .2)

To make better use of STEAM and digital technologies in youth work as a means of addressing the digital gap among young people, regardless of background, member states need to address barriers:

> Consider all barriers, including all forms of discrimination and gender stereotyping, that could negatively affect young people's opportunities and motivation to acquire digital competence throughout their education, training and professional pathways, and to take up science, technology, art, engineering and mathematics (STEAM) studies and careers. (Council of the European Union, 2019, p .6)

The potential efficacy of delivery of STEM engagement in youth work and other informal settings is identified at a National level in the Report of the STEM Education Review Group (Department of Education and Skills, 2016), which acknowledges the value of initiatives outside of the formal education system which support skills development and inquiry:

> Numerous informal, extra-curricular STEM initiatives that emphasise inquiry-based learning, skills development, curiosity-inspired projects and a focus on STEM careers, are active across Ireland and are having a substantial impact. (Department of Education and Skills, 2016, p. 23)

The report refers specifically to how informal, extracurricular learning environments, such as science fairs, competitions and coding clubs offer a rich opportunity for young people to learn and apply STEM concepts:

> Such initiatives allow students to develop strong ownership of their projects and results, to apply a hands-on experimental and problem-based learning approach, to work on topics that motivate and interest them, to develop their own investigations and models and to communicate their results. (Department of Education and Skills, 2016, p. 36)

The importance of STEM education and engagement in informal settings is also recognised in the STEM Education Policy Statement 2017-2026 (Department of Education and Skills, 2017) which outlines a vision for STEM education as follows:

> In line with our ambition to have the best education and training service in Europe by 2026, Ireland will be internationally recognised as providing the highest quality STEM education experience for learners that nurtures curiosity, inquiry, problem-solving, creativity, ethical behaviour, confidence, and persistence, along with the excitement of collaborative innovation. (Department of Education and Skills, 2017, p. 12)

The policy recognises that STEM learning happens in both formal and informal settings within an evolving eco-system, which is supported by a range of stakeholders. The NYCI TechSpace project demonstrated how youthwork has a valuable role to play within Ireland's wider STEM education ecosystem (NYCI, 2019).

The STEM Education Policy Statement recognises "*the strong linkage between STEM and Arts education which fosters design, creativity and innovation* (Department of Education and Skills, 2016, p. 6)*.* Many of the skills

commonly used in arts and crafts in youth work settings, for example, design thinking, curiosity, creativity, communication and collaboration can also be applied in STEM. Art and crafts can be used as a familiar starting point and a gateway to STEAM projects that have wider appeal to both youth workers and young people, particularly those who don't think science is 'for them'.

NYCI's STEAM in Youth Work support services

NYCI has developed and delivered a range of capacity building services to youth workers, Youthreach[2] staff and other practitioners in youth work and non-formal educational settings. NYCI's STEAM in Youth Work support services are comprised of a range of continuous professional development options, resources, project payments for equipment and Scientist in Youth Work Residencies.

Continuous professional development (CPD) programmes

A range of options including introductory and intermediate days and a three-day STEAM School were developed to support participants in including STEAM in their youth work practice. Options were available for those starting to use STEAM in their practice and for those already doing so to provide ideas and resources and develop capacity and confidence. Additional workshops on gaming and story building for digital projects were also offered.

- STEAM in Youth Work / Youthreach introductory training day.
- STEAM in Youth Work / Youthreach intermediate training day.
- STEAM in Youth Work, Residential STEAM School.
- STEAM School 2019 Booster Day.
- Story Building for Digital Projects.
- Games in Youth Work: Engaging Young People in Development Education Course.
- Expert Site Support Visits (following attendance at CPD).

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[2] The Youthreach programme provides two years integrated education, training and work experience for unemployed early school leavers without any qualifications or vocational training who are between 15 and 20 years of age. There are almost 6,000 places available nationwide under the Youthreach umbrella. Almost 3,700 of these places are provided by local Education and Training Boards (ETBs) in just over 100 Youthreach centres. The majority of the remainder of places are provided by FÁS in Community Training Centres. Source: Department of Education and Skills https://www.education.ie/en/Learners/Information/Youthreach/ (Accessed 27.11.2020).

Introductory training day

During the introductory training day participants undertook a range of STEAM activities to gain the skills and knowledge needed to facilitate high-quality STEAM learning experiences for young people. The programme provided opportunities to:

- Learn how to solder.
- Use a Makey Makey to turn an everyday object, such as a bunch of flowers, into a computer keyboard. (A Makey Makey is a simple kit which turns everyday objects into touchpads and combines them with the internet).
- Make simple circuits.
- Make scribble bots.
- Make speakers.

Following the training, participants received a project payment for equipment and had access to follow-up support and resources including activity guides, logic models and equipment lists. They were also offered networking and peer learning opportunities. If participants used what they learned in practice, they were offered intermediate training days at reduced prices.

Intermediate training day 1

Initial intermediate-level training targeted those who had already received introductory STEAM training and/or were already using STEAM in their youth work practice. Participants engaged in new STEAM activities and explored how including STEAM can add value to youth work. They were also invited to reflect with peers on the opportunities and challenges faced in using STEAM in youth work practice. The programme provided opportunities to:

- Build a mini-robot bug, a playback recorder and an electronic musical instrument using Makey Makey.
- Practice STEAM technical skills to pass on to young people (soldering and circuitry).
- Gain an understanding of the fundamentals of the science involved and the confidence to explain it to young people in ways that spark curiosity.

Intermediate training day 2

Participants completed a range of new STEAM activities, explored how including STEAM can add unique value to youth work and began planning STEAM programmes and projects with peers. Participants created graphene circuits, explored basic coding with BBC Micro:Bits, designed elements for custom-made games, and practiced the basics of 3D printing.

STEAM School 2019, three-day residential programme (NUI Maynooth)

This three-day residential programme held in September 2019 offered participants training in pinhole photography and paper art and circuits with youth arts specialists Brian Cregan and Maeve Clancy. It took place over three days at the National University of Maynooth (south campus), Co. Kildare. The programme was delivered as part of a collaboration between NYCI's Youth Arts Programme and STEAM in Youth Work project. On completion, participants became eligible to apply for a €5,000 Scientist in Youth Work Residency project payment. The programme was aimed at youth workers, volunteers and youth arts practitioners looking for new skills for delivering creative activities using STEAM, and the confidence to use them in their youth work practice. The modules were designed and structured to accommodate those who wanted to conquer their fear of STEAM in youth work while, at the same time, providing opportunities for advanced skill and knowledge development for those who have been using STEAM within their youth work practice for some time.

Camera Obscura

Participants learned how to construct their own pinhole camera (camera obscura) and learned how to use it to take photographs. They also learned how to develop photographs in a dark room, and how to build a dark room. The fundamentals of the science of light and colour and applying learning to engage young people were also covered. Participants were provided with an equipment kit and programme to use on return to their own organisation.

Paper art and circuits

Participants took part in a workshop which integrated art and science in an accessible way through paper art and circuits. Skills acquisition workshops which included drawing exercises, designing & building paper circuits, story creation and pop-up/paper engineering were also offered. Participants applied these skills in the creation of pop-up paper books or sculptures that incorporated circuits to enhance storytelling. The tutor, Maeve Clancy, also talked through her own preparation process for workshops and how to encourage co-learning between the youth worker and young person in STEAM projects.

Following the course participants were offered further support through a STEAM School 2019 Booster Day, five months after the initial training, and some also had site visits by the course tutors.

Project payments to support STEAM in youth work practice

A range of funding options were offered to participants in CPD to support implementation of STEAM in youth work practice as follows:

- The Scientist in Youth Work Residency project payments supported 6 STEAM projects with €5000 in funding (this was contingent on having participated in the three-day STEAM school and subject to an application process).
- Project payments for resources, and equipment dissemination provided access to a variety of equipment kits. This facilitated delivery of a variety of STEAM taster activities and sessions with young people, based on content covered in CPD.
  - €150 STEAM equipment project payment, Summer 2020.
  - €300 STEAM equipment project payment, Summer 2020.
  - STEAM equipment kit 2019/2020.
  - STEAM training, equipment project payments, kits and support 2017/2018.

Scientist in youth work residency project payments

The six projects which received a €5,000 Scientist in Youth Work Residency project payment were based in a diverse range of youth work settings and explored a range of STEAM themes as follows:

- Glangevlin Youth Club, Glangevlin, Co. Cavan: Ecology, landscape, and textiles.

- YMCA Ireland Cobh, Co. Cork: Perception of light in relation to physics, neuroscience, astronomy, and mental health.

- Youth Work Ireland Tipperary Thurles, Co. Tipperary: Creative exploration of the Sustainable Development Goals through digital fabrication and upcycling waste.

- Galway Arts Centre: Storytelling through pop up books with circuits on the theme of space and the universe, delivered to young people living in Direct Provision.

- East Wicklow Youth Service Arklow, Co. Wicklow: Local ecology field study and botanical art.

- Foróige Mayo: Exploring light technology through photography and film.

Rollout of supports

The supports were rolled out from 2017 to 2020, see Appendix 1 for a full details of training events, equipment kits and project payments. During the pandemic training was adapted for delivery online.

Evaluation aim

In undertaking this evaluation survey, NYCI hopes to ascertain:

- The impact of the various capacity development services NYCI has delivered to practitioners on their practice.
- The nature of practice which NYCI's STEAM in Youth Work project has supported within youth work and other non-formal education settings.
- The profile and numbers of young people that youth workers and Youthreach staff will go on to deliver STEAM in youth work to.
- Practitioners' perceptions about benefits of including STEAM in Youth Work for the young people they work with.
- Impacts on the policy and practice of youth work organisations.
- The quality and effectiveness of NYCI's STEAM in Youth Work support services.
- Barriers and enablers to delivering STEAM in youth work and other non-formal education settings.

Methodology

As part of the evaluation of NYCI's STEAM in Youth Work project Sinéad Begley and Associates were appointed to design, conduct and report on an online evaluation survey. NYCI's STEAM in Youth Work Project Manager disseminated a link to the survey by email to 298 participants in CPD offered as part of the NYCI's STEAM in Youth Work Programme. The survey was open from 21 October until 11 November 2020 and respondents were invited to opt into a prize draw for an equipment grant worth €150.
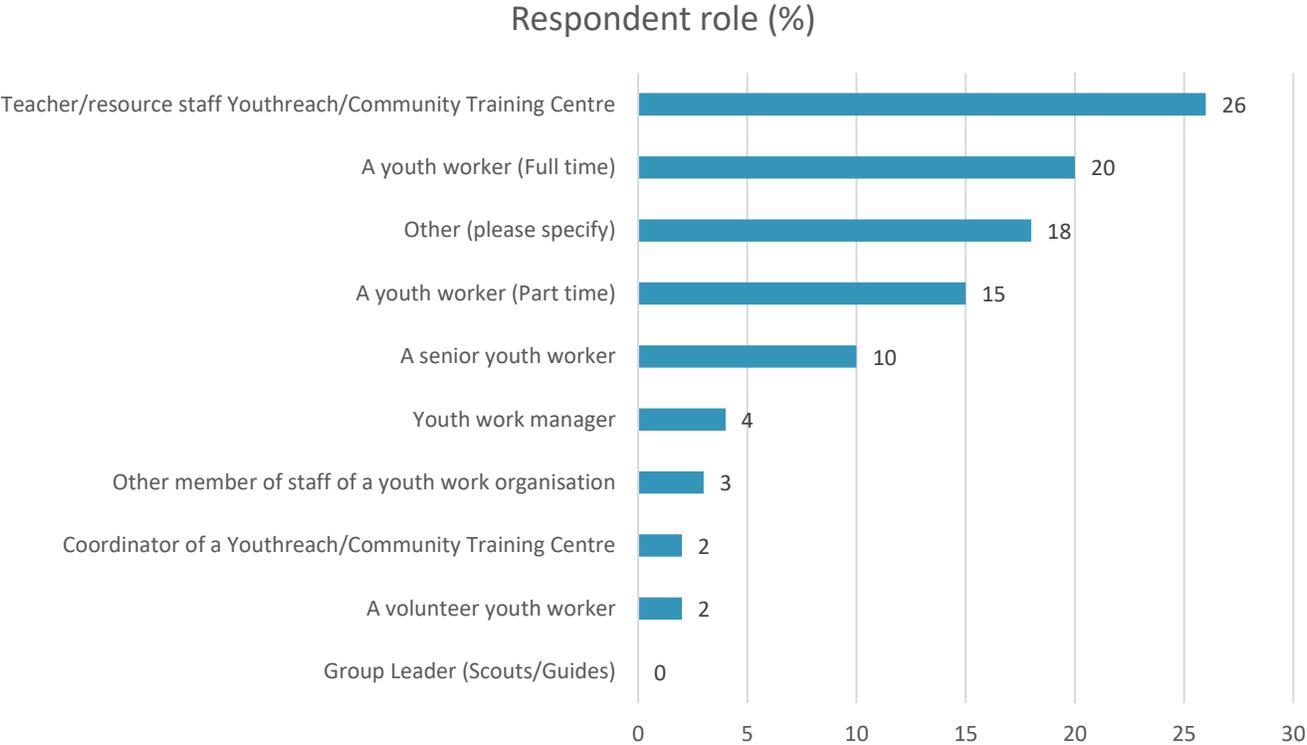
The survey results are detailed in in Section 2 of this report, followed by key findings in Section 3. The conclusions and recommendations are detailed in Section 4.

2. Survey Findings

A hyperlink to the online survey was sent by the STEAM in Youth Work Project Manager to 298 people that participated in continuous professional development offered through NYCI's STEAM in Youth Work support services between 2017 and 2020. A total of 109 responses were received, which represents a 37% response rate.

Respondent profile

Graph 1. Respondent role

Respondent role (%)

Role	Value
Teacher/resource staff Youthreach/Community Training Centre	26
A youth worker (Full time)	20
Other (please specify)	18
A youth worker (Part time)	15
A senior youth worker	10
Youth work manager	4
Other member of staff of a youth work organisation	3
Coordinator of a Youthreach/Community Training Centre	2
A volunteer youth worker	2
Group Leader (Scouts/Guides)	0

Just over half (54%) of respondents are involved in youth work; (47%) are youth workers (10% senior, 20% fulltime, 15% part time and 2% are volunteers); 4% are youth work managers; 3% are other staff members in youth work settings. A further 28% are teachers, resource staff or coordinators in Youthreach or Community Training Centres. The 18% of respondents who described other roles include STEAM practitioners, artists, arts facilitators or educators, family support and school completion workers, social care managers, adult education tutors, Special Needs Assistant running an afterschool STEM club, and a third level Outreach Project Coordinator.

About a quarter (27%) of respondents do not identify as STEAM practitioners. Of the remainder, arts (39%) and technology (33%) are most frequently identified by respondents as their main area of STEAM expertise or interest. A smaller proportion of respondents describe themselves as having expertise/interest in science (17%), maths (16%), and engineering (12%). Other areas of STEAM expertise described in open-ended responses include IT Skills, arts and craft, and 3D design and printing.

Graph 2. STEAM practitioners' main area of interest or expertise
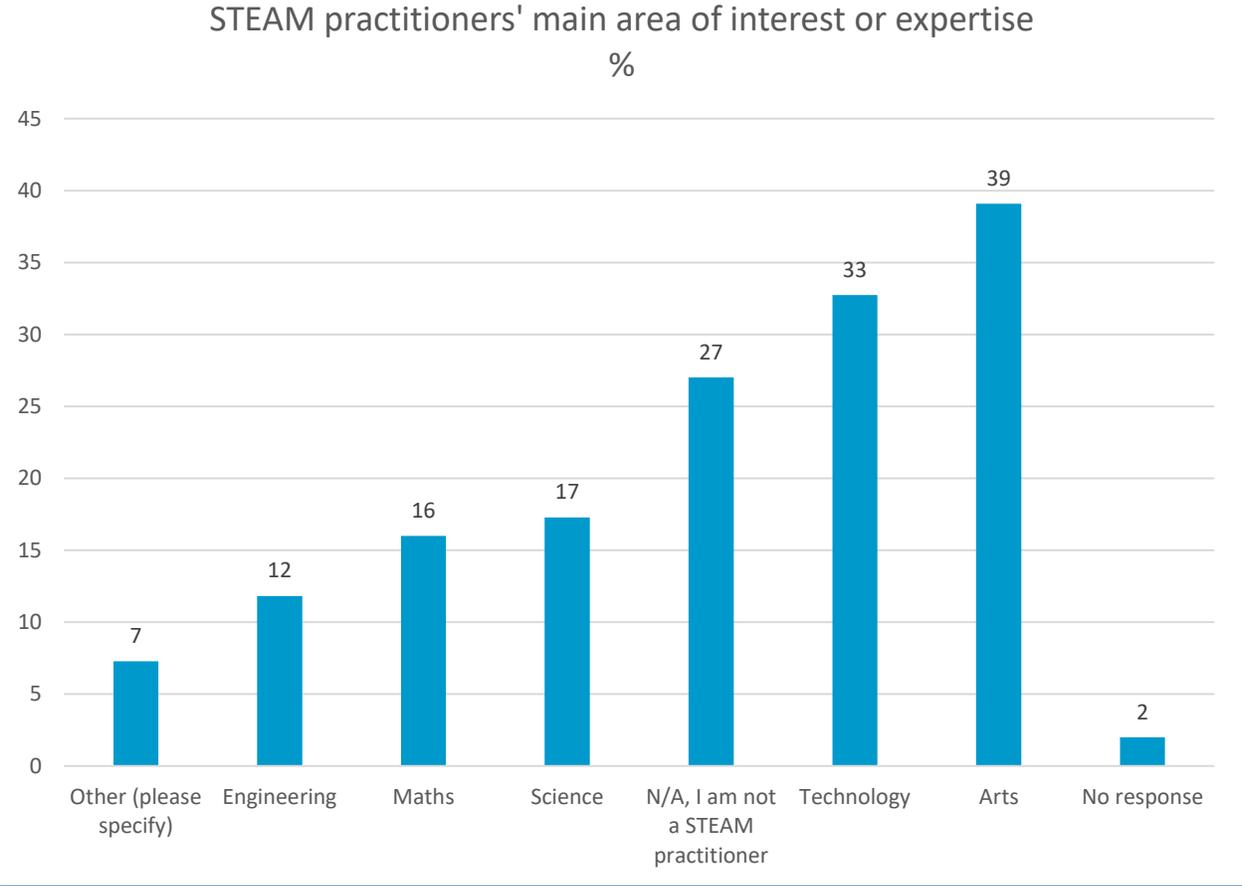
A third of respondents say they never used STEAM in their practice to engage young people, prior to availing of NYCI supports. 17% of respondents say they never used STEAM prior to engaging with the supports and indicate they have gone on to apply the learning to their practice in the past 12 months.

Graph 3. Use of STEAM in youth work practice among respondents

Prior to availing of the service(s), how often had you used STEAM to engage young people in a youth work setting?

Monthly
13%

Weekly
14%

Never
33%

No response
19%

Once or twice a year
21%
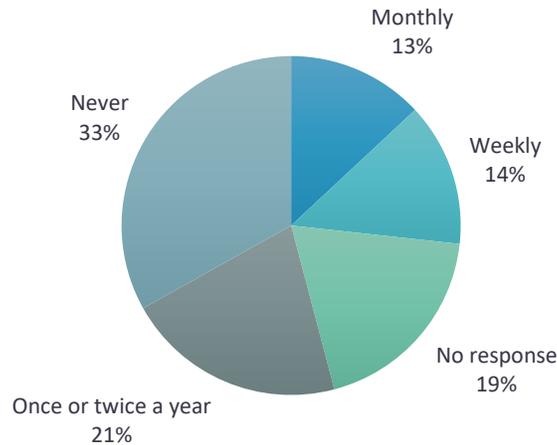
Some comments reflect a realisation, on the respondent's part, that they were using STEAM, while others reflected on how their perception of their own practice had changed:

'The summer school highlight to me where STEAM sat within my practice and recognise that I was already engaging young people through STEAM… Prior to this experience I had not recognised myself as a 'STEAM Practitioner'.

'We had through music and film but never understood it to be part of STEAM or Digital Youth Work'.

'We would have done projects we didn't call STEAM but they were'.

Some respondents lacked the confidence to use STEAM:

'I didn't know where to start! I didn't have the confidence'.

Practice supported by NYCI's STEAM in Youth Work support services

It is important to note that the COVID-19 pandemic and resulting restrictions over the period from March to November 2020, impacted delivery of services in the youth work and Youthreach sectors significantly. This resulted in reduced contact time with young people and a range of other negative impacts on service delivery.

The pandemic also reduced opportunities for respondents to apply what they had learned through availing of NYCI's STEAM in Youth Work support services. COVID-19 has prevented or impeded the implementation of planned STEAM projects for a large proportion of respondents; 36% of respondents say projects were prevented from proceeding at all and a further 48% say it has impeded progress to some extent. Only 3% of respondents say there was no impact (13% no response).

Application of enhanced STEAM in youth work practice services over the past 12 months (October 2019 – October 2020)

- Despite public health restrictions, 57% of respondents say they have applied what they learned through availing of NYCI's STEAM in Youth Work support services over the past 12 months, 27% say they have not (16% no response).
- Of the 22% who explained why they had not yet applied the learning, COVID-19 and time constraints were the most frequently cited reasons.

Context or setting

- The most common settings for application of new STEAM in youth work practice by respondents (based on 51% of respondents who provided details) are youth clubs (48%), Youthreach or Community Training Centre (25%) or other educational settings (25%). 23% of respondents that applied their new STEAM skills did so in contexts where they were working with young people from marginalised and minority communities, and 11% in homework clubs.
- Other settings included Arts Centres (9%), Direct Provision Centres (4%) Garda Diversion projects (4%), family support (4%), and mental health projects or organisations (4%).

Profile of young people engaged

- Despite the severe impact of COVID-19 restrictions 1900 young people (based on 52% of respondents that provided a figure), participated in projects delivered by respondents, where they applied what they learned through availing of NYCI's STEAM in Youth Work support services over the past 12 months. This is likely to have been significantly higher if the pandemic had not occurred, which is reflected in the fact that 72% of respondents, who provided details, estimate 3,875 young people will benefit from their enhanced practice or the STEAM projects they or their organisation will deliver within the next year (to November 2021).
- 81% of respondents who applied learning in projects over the past 12 months indicate the projects engaged young people who are male, female (77%), non-binary (15%), and other descriptors (8%). 7% did not provide details.

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- 61% of respondents indicate that the young people with whom they have, or intend to, use their enhanced STEAM in youth work practice, experience challenges, disadvantages or inequalities, 5% say they don't, 9% don't know (25% no response).

Table 1. Contexts where STEAM projects or activities have been delivered by respondents

Contexts where STEAM projects or activities have been delivered by respondents	%
Youth club	48
Youthreach or Community Training Centre	25
Education project/organisation	25
Organisations working with young people from marginalised and minority communities	23
Homework club	11
Arts centre	9
Other (please specify)	9
Garda Diversion project	4
Direct provision	4
Family support project/organisation	4
Mental health project/organisation	4

Based on 56 responses (51% of all respondents)

Projects and activities undertaken, where respondents applied STEAM learning to their practice

45% of respondents provided details of STEAM or other activities/projects, delivered over the past 12 months, where they have applied their learning from NYCI's STEAM in Youth Work support services. A diverse range of projects and activities are described including dedicated STEAM maker workshops, STEAM camps, and 6-week STEAM programmes which integrate STEAM across a range of initiatives.

> *'… we are delivering a 6-week programme covering the 5 letters i.e., Science, Tech, Engineering, Arts and Maths and a final week of the young people's choice'.*

> *'We have integrated STEAM into all our work in the project. We have run STEAM Camps, Music Camps. We Focus on the key skills when introducing them to the different activities. Focus on key essential skills that young people may require for potential training or job opportunities'.*

One respondent described a 10-week pilot of a STEAM Club as a 'special interest' after school programme in response to an identified need in the organisation's catchment area.

> *'… delivered a STEAM Club as a 'special interest' after school programme in response to the high presence of after school homework clubs in the … area. We felt that we could offer a novel and interactive way of engaging the children and young people within the … area. The STEAM Club began as a 10-week pilot project, however, due to the interest, enjoyment and high engagement from the young people, it was continued on…'.*

Others described how the young people took part in science fairs and festivals e.g., Creative Techfest[3] as a focus for STEAM engagement.

> *'Dedicated STEAM maker workshops with young people, programmes based around making entries for creative tech fest and online group work during lockdown'.*

Some respondents sent STEAM packs to young people or brought STEAM work outdoors or online to sustain contact and engagement with the young people during COVID-19 restrictions.

STEAM content of projects and activities

A diverse range of STEAM content and topics were covered by respondents in the course of their work over the 12 months prior to the survey (October 2019 - October2020). The content delivered during NYCI's STEAM in Youth Work CPD features prominently in respondents' comments e.g., photography, camera obscura, paper art and circuits, Makey Makey and scribble bots.

> *'The children have engaged in many activities which the project worker had learned on the various NYCI trainings they took part in e.g., holograms; scribble bots; paper circuits; stop motion film making etc.'.*

Science: Light and photography, circuitry and electronics, sound, ecology and natural sciences.

> *'We were working outside mostly, during our walks we did photography with a many different focuses i.e., insects, trees, light, perspective. This brought up many discussions around art, nature, ecology, wellbeing and horticulture'.*

Technology: Scratch, Hour of Code, Flappy Bird, Tech Fest Sculpture project, game development, holograms.

Engineering and making: Scribble bots & robotics, Lego club, Makey Makey, 2 player pinball machine, speakers, microphones, electronic kit projects (amplifier, radio, light game), Micro:Bits, working with motors, and a rocketeering programme.

> *'We have spent time exploring what happens in engineering. Groups have enjoyed making fans, race cars, light up cards, scribble bots'.*

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[3] ESB Creative Tech Fest 2020 brought together over 1000 young people from over 50 youth organisations and Gaelscoileanna across Ireland to celebrate their technology creations, inventions and inspirations. Source: https://techspace.ie/events/esb-creative-tech-fest/ (Accessed 27.11.2020).

'Art classes collaborated in the design and construction of motor driven vehicles. This project combined Art, Craft, Design and Mechanical skills in an enjoyable way'.

'Intro to Engineering for small kids where they learn the basics for how to be an Engineer and the creativity that comes with all'.

Photography and visual arts: Comic book creations, light photography, camera obscura and pinhole photography, board game creations, making hand-held telescopes, pop up art, animation, set building.

'We have used both pop up art and the circuitry in our STEM classes. Becoming more creative and creating new ways to present the students ideas. Instead of a usual Powerpoint we have showed the kids these skills and asked them to be more creative'.

Music: Online music project through technology.

Maths: Art and maths project; Geometry and curve stitching.

Engagement with NYCI's STEAM in Youth Work support services

Of the 86% of respondents who provided details of the NYCI's STEAM in Youth Work support services of which they availed:

- 50% took part in introductory training (in-person), and 20% in intermediate training (in-person), 29% in online training and 21% in residential STEAM school.
- 28% availed of STEAM in Youth Work equipment project payments (€55 - €300) and 6% availed of a STEAM in Youth Work Residencies (payments of up to €5,000).

Table 2. Uptake of NYCI's STEAM in Youth Work support services

NYCI's STEAM in Youth Work support services	% respondents who availed
STEAM in Youth Work introductory training day (in person)	50
STEAM in Youth Work online training	29
STEAM in Youth Work equipment project payments (€55 - €300)	28
STEAM School 2019 three-day residential programme	21
STEAM in Youth Work intermediate training day (in person)	20
Games in Youth Work CPD	8
STEAM in Youth Work Expert Site Support Visit (M.Clancy, B.Cregan or TechSpace)	7
STEAM School 2019 Booster Day, Dublin February 2020	7
STEAM in Youth Work Residency project payment (up to €5,000)	6
Other (please specify)	2
No response	14

Quality and effectiveness of NYCI's STEAM in Youth Work support services

Graph 4. Respondent rating of the quality of NYCI's STEAM in Youth Work support services
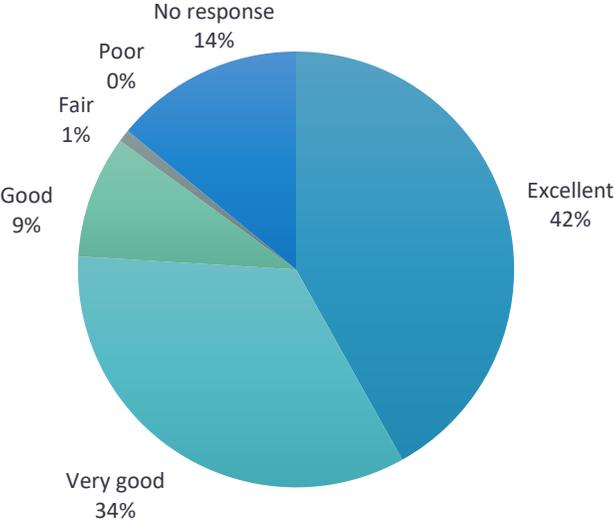
Over three quarters of respondents rated the supports as excellent (42%) or very good (34%), and 9% rated them as good. One respondent rated the supports as fair and did not give a reason. Most of the open-ended comments, (offered by 65% or respondents) were positive and related in the main to the level of support received from NYCI staff and STEAM practitioners and the quality of CPD, which enabled respondents to engage young people and develop their own STEAM skills and practice. Through modelling practical, hands-on replicable examples of good practice tutors enabled respondents to develop their own STEAM practice and confidence. Some respondents also mentioned the opportunities for networking and connection during the COVID-19 restrictions and the assistance with grant applications.

The level of support from both NYCI staff and STEAM practitioners

> *'The training and support provided was very well planned and executed. The NYCI team showed a genuine interest in our project and ensured there was a system of support throughout the life of the project'.*

> *'I felt that they were genuinely interested in supporting us as practitioners to accomplish something worthwhile with our young people'.*

> *'The expert/Steam practitioners have been very knowledgeable and approachable. Support from NCYI has been very efficient also'.*

'Knowledgeable, patient, tutors. Organised, friendly and approachable staff'.

High quality, practical, hands-on CPD provided replicable examples of good practice and enabled respondents to develop their own STEAM practice and confidence

'It was the best course that I ever did! really enjoyed it as it was practical and informative. I was quite motivated after it and even the coordinator noticed my enthusiasm'.

'Creative content and excellent imaginative delivery'.

'The objectives were clear, the learning was in perfect sizeable and understandable chunks, the facilitators were knowledgeable and friendly, connections between participants was encouraged'.

'Training kick-started STEAM in my practice'.

'It's great to get new ideas and get to try out making things before taking the ideas to your own class. The person running the class was very enthusiastic and great at demonstrating and explaining everything'.

'I now am more relaxed when delivering STEAM activities with young people. I am more confident and able to enjoy the process of mutual learning with young people. Without the training I would know where to start or even think I am capable. It's fantastic knowing that you have support to enhance our projects'.

'Starting with little technical knowledge I found all interactions very helpful, instructive and empowering'.

'The team were always available to trouble shoot with. Always listened to our experiences implementing steam in youth worker and gave a space to share advice'.

Enabling STEAM and effective engagement of young people

'STEAM has enhanced that work that we do and it is so relevant to young people. Training, equipment and advice has enabled us to deliver exciting and innovative STEAM programmes'.

'It just opened up a whole new world to us'.

'The Team and Techspace have been a great support to myself and (youth work setting) over the past 4 years in relation to training, equipment grants and sharing of knowledge, ideas and support to run STEAM in Youth Work activities for young people'.

'I took part in two in house STEAM workshops with our young people and the guidance and self discovery that took part within the session was very enriching for the development of the YP practical and social skills'.

Understanding of the contexts the respondents work in and the needs of young people

'The instructors are enthusiastic, knowledgeable and au fait with the kind of learners who attend Youthreach. They appreciate the importance of providing accessible "hooks" to encourage and trigger interest from early successes for young learners'.

'The facilitators were knowledgeable, experienced and enthusiastic. They had experience of delivering to teenagers so could speak first hand and suggest doable project and STEAM activities'.

Networking and connection during the pandemic

'Always interactive and fun which makes it easier to understand. You make new connections through these also'.

'Even when the lockdown initially came into place and I felt helpless not being able to connect with my youth group, I was able to take part in NYCI lead Zoom meet-ups where I could connect with other youth workers around the isle. This gave me great hope as well as encouragement, motivating me to keep trying and not to lose hope during these difficult times'.

'While I have not availed of all services I feel that the offer of support and the constant check ins through email, keep me connected to what is going on in the area of STEAM in Youthwork'.

Assistance with accessing project payments

'The help in applying for the grant for the staff was invaluable and working with them has been very easy'.

'I was under a lot of time pressure and NYCI went of their way to be supportive and remind me of deadlines to avail of grants. Willing to offer solutions and always willing to answer stupid questions I had'.

Graph 5. Efficacy of NYCI's STEAM in Youth Work support services in enabling respondents to include STEAM in their practice
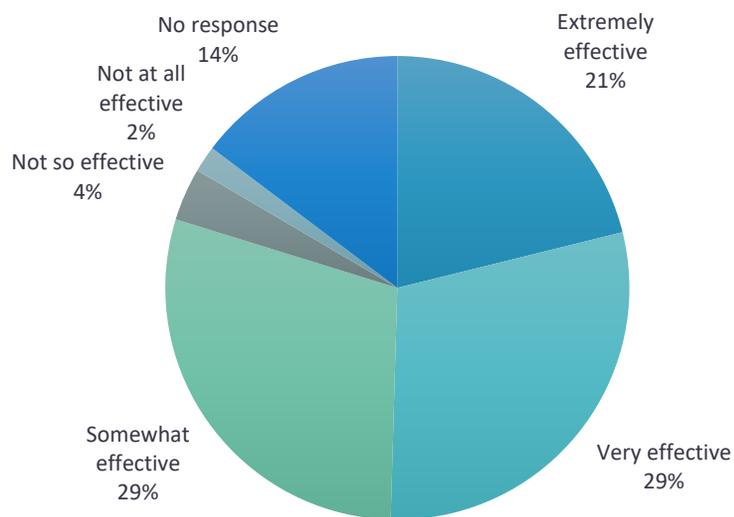
50% of respondents found NYCI's STEAM in Youth Work support services extremely or very effective in enabling inclusion of STEAM in their youth work practice. The reasons given further reflect an appreciation among respondents for a holistic suite of supports, which facilitated upskilling in terms of STEAM content knowledge and skills, replicable modelling of good practice and availability of support for sourcing equipment.

> *'The support from the team and the amount of equipment and grants received have allowed me to introduce STEAM into the centre comfortably without seeking extra funding for an area not already on our programme'.*
>
> *'Having opportunity to learn from other STEAM Practitioners, develop a language around STEAM processes, and being presented with a huge amount of new tools, enabled me to embed STEAM more fully into my practice'.*
>
> *'The Residential Programme was great in that I was able to receive some materials from partaking in this to bring to my youth group to kick start the project'.*
>
> *'I have been able to develop confidence in delivering steam related activities. I have used many of the activities covered in trainings with children to great effect-it is a really exciting way of engaging with children'.*
>
> *'They have been amazing, alerting to new grants, sending out booklets to circulate with staff. Answering all my questions. Creating opportunities during lockdown to get funding'.*

A further 29% found the supports to be somewhat effective, while 6% say they have been not so effective or not at all effective. The reasons respondents gave included COVID-19 restrictions, time constraints, IT issues,

competing priorities or other pressures. None of the comments reflect a specific issue with the supports. One respondent said ongoing support would be appreciated:

> *'Like everything it's great to have the ideas but sometimes we need more and then also the resources/funding to be able to bring what we have learnt to our groups. Maybe more equipment packs and more regular funding would be great'.*

Graph 6. Efficacy of NYCI's STEAM in Youth Work support services in supporting delivery of STEAM projects that young people enjoy
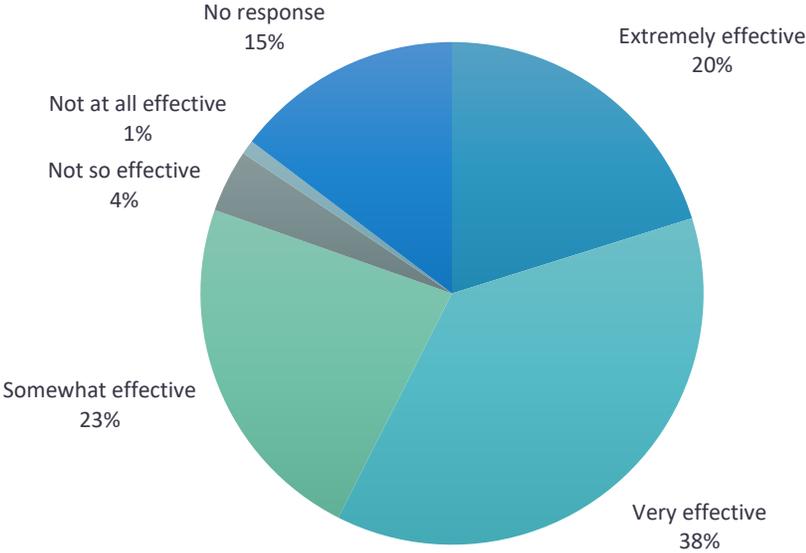
58% of respondents say NYCI's STEAM in Youth Work support services are extremely (20%) or very effective (38%) in supporting delivery of STEAM projects that young people enjoy. Comments offered by this cohort relating specifically to young people they worked with, describe how they enjoy practical activities and inquiry-led processes and are excited or engaged by the project ideas shared at CPD.

Engaging young people using STEAM and inquiry

> *'The learners and I are having great enjoyment from learning the basics and tinkering with new equipment and materials…'.*

> *'Young people have really enjoyed tinkering and just trial and error. I found the training very supportive in understanding the process is as important if not more than the end result'.*

> *'The majority of our young people would be kinaesthetic learners. The activities, project and ideas that are developed by NYCI STEAM fit with our learners. They learn skills such as*

teamwork, communication, problem solving. They are learning in such a way as they do not realise they are learning. They are learning through doing and discovery'.

'We have received great feedback from young people and parents on the activities as a result of our involvement in this project from the onset'.

'The young people with whom I worked displayed a genuine interest in the project - both the art and science aspects'.

'Flexibility. Offering support and resources. Placing young people at the centre'.

Additional comments reinforce the themes of comments in the previous question and related mainly to how the project ideas, CPD, and equipment provided enabled respondents to deliver enjoyable STEAM projects.

Providing resources and ideas which enable appealing and achievable STEAM projects and activities

'Genuine interest and sense of fun, lots of active learning and good demos'.

'The ideas for projects are amazing. I love to see the kids eyes pop when you tell them what they're going to do next'.

'The projects are achievable, quick to show results, and enjoyable'.

Equipment and project payments

'Access to grants and information on how to source steam-related materials and resources has been so useful'.

'Gave us ideas for programmes and activities as well as suggesting suppliers for kit's'.

Opportunities for networking and practice sharing

'I feel NYCI very effectively provided a space where seasoned Youth Workers can guide and share their wisdom to other Youth Workers. As someone who does not have much experience in this field, this was extremely helpful for me. I feel the support I received through NYCI STEAM in Youth Work support service had a massive positive impact on how I was able to deliver my STEAM project'.

CPD built confidence and facilitated respondents' effective use of STEAM in their youth work practice

'I was encourage and stimulated by the training'.

'Had I not received the training and support from NYCI I would probably not have ventured into this area and had I, then I would have been overly cautious and nervous which would have effected the learner's enjoyment and input'.

23% of respondents rated the supports as somewhat effective and a further 5% as not so effective or not at all effective in enabling delivery of enjoyable STEAM engagement. Comments from the later cohort related to time

constraints and COVID-19 related disruption. A small number of comments related to the effectiveness or content of the supports e.g., the activities being more geared to boys, CPD content being a good introduction to STEAM but not capturing the imagination of some groups and a need for more prolonged contact with trainers.

'I feel some of the activities are limiting. And are geared more towards boys'.

'What the training gives is projects and breakdown that are great intro to STEAM for kids, but these smaller(projects) don't always capture the imagination of some groups. in practice so far larger projects that develop as the group get involved in the program work'.

'Only seen the trainers on the training days and haven't heard from them since'.

'I think we need some more tech things to make. especially around robotics or movement'.

Changes in respondents' practice

Respondents were asked the extent to which they agreed with a series of statements about the impact of availing of NYCI's STEAM in Youth Work support services on their practice. Two thirds of respondents agreed that they feel more confident in using STEAM and 70% agree they developed their own STEAM knowledge and skills. 60% are using STEAM more often with young people and 47% are spending more time doing STEAM activities and using inquiry-based approaches more often. Almost half (49%) of respondents applied what they learned in other non-STEAM related contexts.

Table 3. Impact of supports on respondent practice

Thinking about the time since you availed of the supports, please indicate the degree to which you agree or disagree with the following statements:	Average weight 1=Agree strongly, 5=Disagree strongly	% Agree
I feel more confident using STEAM	2.02	66
I've developed my own STEAM knowledge and skills	2.04	70
I use STEAM more often with young people	2.2	60
I applied what I learned in other non-STEAM related contexts	2.36	49
I spend more time doing STEAM activities with young people	2.39	47
I use inquiry lead approaches more often	2.41	47
No response		17

16% of respondents have collaborated with a STEAM practitioner to deliver a project as a result of availing of the STEAM support services, 9% for the first time. A further 38% plan to do so. 29% have no plans in this regard.

Table 4. Collaboration with STEAM practitioners

Did any collaboration with a STEAM practitioner to deliver a project result from availing of the STEAM support services?	%
No, I have no plans to do so at present	29
Not yet but I plan to collaborate with a STEAM practitioner(s) to deliver a project in the future	38
Yes, I collaborated for the first time with a STEAM practitioner to deliver a project	9
Yes, I developed an additional collaboration(s) with a STEAM practitioner(s) to deliver a project	7
Other (please specify)	5
No response	20

Over half (54%) of respondents reported changes in their practice as a result of availing of NYCI's STEAM in Youth Work support services, 28% say there has been no change (18% no response). 51% of respondents described the change in their practice in open-ended comments. Some described delivering new STEAM programmes or using new content or ideas e.g., SCRATCH programming, Hour of Code, portable holograms, media and journalism training, and investigations for Science Week. Others describe offering more STEAM based programming or embedding STEAM in their practice e.g., a dedicated maker space or summer camps. Others describe increased skill and confidence among staff and expanded use of STEAM, to reach more young people.

Increased use and integration of STEAM in respondent practice and organisation programming

'I have loads of new ideas and will be introducing some of them across other curriculum subjects'.

'STEAM is now a regular programme run across all the age groups'.

'We have opened a dedicated makerspace as well as including activities such as soldering and making through tech as a staple part of our practice'.

'STEAM has become more embedded into my practice / facilitation process. I have gained new tools which I have used and incorporated into my practice. NYCI continue to support and offer new STEAM ideas which I can develop upon'.

'We would use it more in all groups and we have been running a STEAM group and summer Camp for a few years'.

'I have tried to include something of STEAM in different modules, not just photography. In teaching the Weaving module we worked with String Art introducing students to Geometry with curve stitching'.

Increased awareness of and confidence in using STEAM and inquiry

'More aware of the importance of STEAM and to increase students awareness of an interest in STEAM subject areas'.

'The whole team is more confident in putting STEAM programmes into practice. I have learned to allow young people to make more mistakes themselves and find their own solutions'.

Expanded use of STEAM, to reach more young people

'We are finding more opportunities to offer it to wider range of young people that access other groups that may not be STEAM related'.

'…we try to push STEAM more into our targeted groups to give young people different opportunities'.

'We have engaged young people who we may not have unless we put on such activities. It has created a more creative space for youth workers and young people alike'.

'I try to incorporate elements of Steam into my groupwork more regularly. I have used it to engage with children differently (e.g., I am working with (young people) who have been demonstrating poor participation in the classroom and I use the STEAM activities as incentives to encourage increased participation)'.

'Young people become very excited to learn a new skill especially in an area they are interested in'.

'Programmes are more interactive and attractive to young people'.

Some respondents reflect on how they have been enabled to increasingly integrate aspects of science, technology, engineering and maths into their own arts-based practice or include an element of art in their STEM practice.

'My own practice as an artist has changed as a result of being the STEAM artist in a youth arts project. Working with the young people has helped me look at a topic which I love in a new light, which is very exciting!'.

'The inclusion of A in my STEM activities'.

'I now know that Steam can be included quite easily into the teaching of Art and Craft'.

'The young people decided that they would like to incorporate aspects of mental health welfare into the project. This proved to be a really good fit and has opened up a new area of research for me personally in my own artwork'.

Impact on the policy and practice of respondents' organisations

While 9% of respondents say availing of NYCI's STEAM in Youth Work support services has resulted in a change in policy in their organisation, 36% say it did not and 33% said they don't know (22% didn't respond).

Respondents who provided details of policy changes referred to more focus on STEAM and inquiry-based learning, and inclusion of STEAM in programmes, timetables and planning.

'STEAM is being embedded as a timetabled class in our centre'.

'More organisational focus on STEAM'.

'There has a push to include inquiry-based learning'.

'It will be part of our Strategic Plan'.

Table 5. Change in organisational practice

Reported change in organisational practice as a direct result of availing of NYCI's STEAM in Youth Work support services	%
More STEAM activities/projects/programmes are planned	43
More engagement with STEAM events, festivals and sites/centres	24
The organisation is now pursuing other funding streams or supports for STEAM	15
Staff will be offered STEAM CPD	10
Volunteers will have opportunities for STEAM training	8
Other (please specify)	4
No response	55

Respondents described a range of changes in organisational practice, which occurred as a direct result of availing of NYCI's STEAM in Youth Work support services. The most common changes were an increase in planned STEAM activities, projects and programmes (43%) or more engagement with STEAM events, festivals and sites/centres (24%). 15% of respondents also said their organisation was now pursuing other funding streams or supports for STEAM. 8% say volunteers will have opportunities for STEAM training.

Perceptions of the benefits to young people of including STEAM in youth work

Respondents who had applied learning in their practice perceived benefits in a number of key areas related to the personal, social and/or educational development of the young person. The majority of the respondents who applied learning to their practice, provided young people with opportunities to engage in hands on STEAM activities (50%). 39% gave young people a say in the project content and planning and almost a quarter (24%) provided opportunities for young people to meet and work with STEAM practitioners.

- 50% agree that the young people's perception of their own abilities improved.
- 43% agree that the young people show more interest in STEAM now.
- 43% agree that the young people have expressed an interest in more STEAM projects in the future.

While 8% found it was difficult to maintain the young people's interest and engagement, the majority report improved engagement with STEAM and positive impacts on young people's perceptions of their own ability. Respondents also noticed a positive change in terms of engagement in learning and love of learning, young people's pride in their work and their self-confidence (See Table 6).

Table 6. Perceived changes in young people's engagement with STEAM

Did you notice any change in the young people involved in terms of the following?	Average score out of 3, 1=positive change, 2=no change, 3=negative change	% of all respondents that perceived a positive change
Engagement in learning	1.02	50
Pride in their work/tangible outputs	1.11	46
Self confidence	1.11	44
Perceptions about relevance of STEAM to their lives	1.25	39
Love of learning	1.26	37
Determination and resilience	1.43	29
Perceptions of STEAM careers	1.44	28

Based on 56 (51%) of respondents

Respondents were asked about their perceptions of the impact on the young people of including STEAM in youth work using a series of questions relating to changes in terms of skills, personal development and STEAM engagement. The majority of those that answered the question agreed that the young people involved had developed or improved a range of skills as outlined in Table 7. There were strong levels of perceived improvement in relation to creativity and imagination, critical thinking and problem solving, communication and interpersonal skills, STEAM Technical Skills, learning independently and adaptability.

Table 7. Skills development

The extent to which respondents feel young people developed or improved the following skills	Average score out of 3, 1=Very much improved, 2=Somewhat improved, 3=No change (Closer to 1 is most improved)	% of all respondents that agree skill developed or improved
Creativity and imagination	1.43	50
Collaboration & team working	1.56	49
Critical thinking & problem solving	1.61	50
Communication and interpersonal skills	1.73	49
STEAM technical skills	1.77	50
Learning independently	1.8	48
Adaptability	1.85	47

Based on 56 (51%) of respondents

In open-ended comments a range of other skills and qualities were mentioned as having improved including:

- Focus and concentration skills, management of expectations, listening skills, research, willingness to try.
- Empathy, patience, perseverance, self-motivation/dedication to finishing projects, connecting with people in other organisations/walks of life.

    'Less fear to give it a go and great believe in the process been able to solve any issue that arrives'.

- Gaining different perspectives.

    'Incorporating the Arts in their work as they gained an appreciation for the variety of Arts and how integral they are to design, technology, engineering'.

    'Perspective on nature to include their wellbeing'.

    'Many of the children who I worked with already had most of the above skills. However, I feel they were able to view these qualities in a different context and therefore appreciate them more'.

Respondents were invited to give their views on the main benefits to young people, of taking part in the STEAM or other projects (delivered over the past 12 months), where they had applied the learning from availing of NYCI's STEAM in Youth Work support services. Half of respondents provided comments, which highlight the development of a range of new, transferable skills, in particular problem solving, creativity, teamwork and communication through hands-on inquiry. Comments reflect a perception that they have provided increased access to enjoyable STEAM engagement, outside of the curriculum or school, in a safe space, for young people who are underserved in terms of such opportunities. Respondents also reflected on how this impacts positively on the young people's views of STEAM and its relevance to them, while developing their confidence, self-belief and pride in their work.

Skills development and learning through inquiry

'Increased problem solving skills, critical thinking and communication skills. Increased communication and presentation skills. All of these combined have helped improve young people's confidence in their own ability and they have gained 21st Century Skills'.

'Problem solving; communication and collaboration; designing; confidence in doing; responsibility for safety; exploration'.

'The young people got to learn a new skill, but also a new way to create projects or present ideas. They were encouraged to be creative and the freedom to make what they want, something they don't usually get from school'.

'Developing critical thinking and creating solutions to problems through a variety of lens'.

'Making and problem solving. Realising they wouldn't electrocute themselves'.

'The Skills they learn. Access to the equipment and machines. To think outside the box and to figure out how things work or how to fix a problem that may arise'.

'Creativity, Investigation skills, Trial and Error, group/team work'.

'Creative ways of building their confidence in their abilities to build from their imagination. Great learning about teamwork, planning, crafting, lateral thinking, exploring, crafting and many more'.

'That it is okay to let go of control and just explore what happens'.

Respondents also alluded to benefits relating to opportunities to engage with, and develop confidence in using digital technology

'Digital skills building. Exploring possibilities. Confidence with Tech and creativity'.

'Improved technical, digital media and STEAM skills'.

'Gaining confidence in using technology and having the materials to work with'.

Offering new, fun and interesting ways of learning, beyond the curriculum and in different contexts

'Learning in a fun way, through doing and producing something. They enjoy having something to show for their learning It is interactive and interesting to young people while teaching them new skills'.

'A change from academic class work'.

'Developing conversations around their interests and viewpoint of the world around them'.

'Being outdoors, wellbeing, taking notice of a different perspective'.

'Discovery, Examination and Fun'.

'Discover new ways of doing things and how the idea of engineering was totally different to what they thought'.

Personal development; building relationships and confidence, enabling self-expression and a sense of pride

'Building relationships with young people whom you didn't know prior to STEAM training'.

'…Develop patience and confidence in completing a small electronic project'.

'In giving them confidence in what they can achieve, and in broadening their range of possibilities'.

'The chance to do something new. They were so excited about showcasing their fabulous work (and showing themselves in a positive light) and are very disappointed that that due to Covid that this is not possible at the moment'.

'New learning and creating opportunities to problem solve. Young people are very proud of their creations and this helps with self esteem and confidence'.

'It also gives them a tool for self expression, as well as being something they can feel proud of and share with the wider community'.

Increased access to STEAM for underserved audiences, opening up awareness of opportunities provided by STEAM

'Kids that wouldn't normally attend clubs, kids with special needs & kids with hidden talents attend our club, their learning & socialising has supported the curriculum, created new friendships & has inspired the kids to create & learn more at home. They are always eager with new ideas & have also taught us 'so called' grown ups an awful lot as a result'.

'To have a safe space that they can come to every week for a couple of hours to get lost in the process of creating. I think it was big for my youth group to have some sort of continuity like that, especially with all of the kids living in a Direct Provision Centre. It was a space where they could focus on hands on activities outside of the school setting'.

'Introduction to world that they think they don't belong to'.

'Learning that science and art are part of their lives and accessible to them'.

'The young people engaged in an activity that they would otherwise not have had access to and worked as a team to build their skills'.

'Opening eyes to new possibilities and resources'.

'Open up different opportunities and interest for young people'.

'Learning new skills which they wouldn't normally get the opportunity to do. Meeting like minded young people. Getting out of their comfort zone. Becoming more creative'.

'Opening up students to new ideas. Making Science more accessible. Having fun!'

'Increased confidence and exposure to subjects they never thought they'd have access to'.

'It provides an opportunity to explore all elements of STEAM in a fun and interactive way and thus enthuses and encourages young people to explore further and chose such subjects to study in school'.

'It encourages them to consider careers in I.T.'.

Barriers and enablers to delivering STEAM in youth work and other non-formal education settings.

Inadequate equipment and materials, and lack of access to (or awareness of) local STEAM practitioners are among the main barriers (identified by 32% and 24% respondents respectively) to delivering STEAM in youth work and other non-formal education settings. Inadequate facilities and space and lack of STEAM knowledge, skills and the confidence in using STEAM also pose a challenge for 23% and 21% of respondents respectively. Other barriers described by 26% of respondents include COVID-19 restrictions and time constraints. Barriers identified by individual respondents included lack of devices for technology, and gender bias for some STEAM activities (outside of NYCI).

Table 8. Barriers to delivery of STEAM

Barriers for respondents to delivery of STEAM in youth work and other non-formal education settings	% of all respondents
Inadequate equipment and materials	32
Other barriers	26
Lack of access/awareness of local STEAM practitioners	24
Inadequate facilities and space	23
Lack of knowledge and skills in STEAM	21
Lack of confidence in using STEAM to engage young people	21
Young people's attitudes to STEAM	11
Young people's previous experiences of STEM	7
No response	**39%**

Based on 67 (61%) responses

Funding, CPD, project payments for equipment, project ideas and access to STEAM practitioners to assist with projects are ranked as most important in terms of support by respondents. There is also strong interest in practice sharing, online resources, and mentoring. Specific factors mentioned as enabling delivery of STEAM in youth work by individual respondents include more supports for girls and women, and training for STEAM practitioners.

> *'More support for female led and female inviting projects'.*

> *'Would there be a possibility of having training specifically the STEAM practitioners, both for upskilling and networking opportunities'.*

Support for working remotely would also be welcome e.g., showcase events online, online session plans, ways of connecting virtually, guidance on video making and editing.

> *'Show case events - could these be on zoom - small groups only'.*

'At the moment, what I need will be creative ways I can connect with my youth group without having to physically be present. As the movement of my Youth Group is massively limited by living in a Direct Provision Centre, if I am to deliver a series of workshops right now it would have to be an one to one workshop via Zoom, or a pre-recorded video workshop'.

Table 9. Ranking of the relative importance of supports

Relative importance of supports for STEAM in youth work and other non-formal education settings	Average weighting out of 5 (1 = Most Important)
Funding for STEAM projects	1.62
Ongoing professional learning opportunities	1.71
Grants for equipment and materials	1.75
Project activities or ideas	1.94
Access to STEAM practitioners to assist with projects	1.96
Practice sharing and networking opportunities	2.14
More online resources	2.28
In person support or mentoring	2.32
No response	**25%**

55% of respondents say they have concrete plans to apply what they have learned through NYCI's STEAM in Youth Work supports when working with young people over the next year, 4% do not and 16% do not know at present (25% no response). The 72% of respondents, who provided details, estimate 3,875 young people will benefit from their enhanced practice or the STEAM projects they or their organisation will deliver within the next year (to November 2021).

3. Key Findings

Respondent profile and engagement with STEAM

- Respondents to the survey work mainly in youth work (54%) and Youthreach or Community Training Centres (28%). A high proportion (61%) say they work with young people who face challenges, disadvantages or inequalities, and comments indicate many are underserved in terms of access and opportunity for STEAM engagement.

- One third of respondents say they had never used STEAM to engage young people in a youth work setting, prior to availing of NYCI's STEAM in Youth Work supports. 17%, who had indicated they never used STEAM previously also indicated that they have applied the learning from NYCI CPD in their practice (between October 2019 and October 2020).

- In terms of the STEAM disciplines, a higher proportion of respondents say their main area of interest and expertise is in art (39%) and technology (33%), than in science (17%), engineering (12%) or maths (16%), which reflects the value of integrating art as a conduit to STEM engagement. Art and crafts can be used as a familiar starting point and a gateway to STEAM projects that have wider appeal to both youth workers and young people, particularly those who don't think science is 'for them'.

The profile and numbers of young people to whom youth workers and Youthreach staff will deliver STEAM in youth work

- Despite the severe impact of COVID-19 on service delivery in the Youthreach and youth work settings, the 52% of respondents (that provided data) applied their STEAM in youth work practice while working with 1900 young people in the period between October 2019 and October 2020.

- The 72% of respondents, that provided details, estimate 3,875 young people will benefit from their enhanced practice, or the STEAM projects they or their organisation will deliver, within the next year (to November 2021).

The nature of practice which NYCI's STEAM in Youth Work project has supported within youth work and other non-formal education settings

- While COVID-19 prevented or impeded the majority (84%) of respondent's ability to implement planned projects, 57% have nonetheless applied STEAM learning from CPD to their practice over the past 12 months. Many programmes had to be adapted and offered online or outdoors due to COVID-19 and some respondents sent STEAM materials or packs to young people to sustain engagement.

- Respondents' enhanced STEAM in youth work practice has been applied primarily in youth clubs, Youthreach or other educational settings. Some respondents applied their STEAM in youth work practice

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while working with young people in a diverse range of other settings including arts centres, homework clubs, Direct Provision Centres and Garda Diversion, family support or mental health projects.

- 45% of respondents described a diverse range of projects where they have applied their learning, including STEAM camps, 6-week block programmes, a STEAM special interest after school club, science fairs, Creative Techfest and maker programmes.

- The projects supported through the various opportunities provided by NYCI are diverse, including for example pinhole photography and light, electronics, robotics, sustainability, coding, ecology and botanical art, space and the universe. While a range of STEAM topics and themes were covered, respondents' comments reflect the prominence of content and ideas covered in CPD such as camera obscura, paper art and circuits, Makey, Makey and scribble bots.

The impact of capacity development services NYCI has delivered to practitioners, on their practice

- Having availed of the STEAM in Youth Work supports, two thirds of respondents agreed that they feel more confident using STEAM and 70% agree that they developed their own STEAM knowledge and skills. Some comments reflect more integration of art into STEM or STEM into arts-based practice.

- 60% are using STEAM more often with young people, 47% are spending more time doing STEAM activities with young people and using inquiry-based approaches more often.

- Over half (54%) of respondents reported changes in their practice as a result of availing of the STEAM in Youth Work support services including increased awareness of and confidence in using STEAM and inquiry, increased use of STEAM in individual practice and organisation programming, expanded use of STEAM to reach more young people in targeted groups and non-STEAM programmes and increased skill and confidence among staff in using STEAM in their practice.

- Almost half (49%) of respondents applied what they learned in other non-STEAM related contexts.

- Availing of the supports has resulted in collaboration with STEAM practitioners on project delivery for 16% of respondents, 9% for the first time. A further 38% have plans to collaborate.

Practitioners' perceptions of benefits of including STEAM in Youth Work for the young people with whom they work

- The majority of those that applied learning to their practice, provided young people with opportunities to engage in hands on STEAM activities (50%). 39% gave young people a say in the project content and planning and almost a quarter (24%) provided opportunities for young people to meet and work with STEAM practitioners.

- The majority of those that applied learning to their practice perceived a positive impact on young people's interest and engagement with STEAM; 43% agree that the young people show more interest in STEAM now and 43% agree that the young people have expressed an interest in more STEAM projects in the future.

- Respondents' comments reflect a perception of having provided increased access to enjoyable STEAM engagement, outside of the curriculum or school, in a safe space, for young people who are underserved in terms of such opportunities. Respondents also reflected on how this impacts positively on the young people's perception of STEAM and its relevance to them.

- 50% of those surveyed agree that the young people's perception of their own abilities improved. The majority that applied enhanced STEAM in youth work practice also noticed a positive change in terms of engagement in learning (50%), young people's pride in their work (46%) and their self-confidence (44%).

- The majority that applied learning to their practice perceived that young people developed and improved a range of transferable skills, particularly creativity and imagination (50%), teamwork and collaboration (49%), and critical thinking and problem solving (50%). Positive change was also observed in STEAM technical skills (50%), communication and interpersonal skills (49%) and learning independently (48%). Some respondents also noticed other positive changes in terms of resilience, perseverance, focus, listening, patience and self-motivation.

The quality and effectiveness of NYCI's STEAM in Youth Work support services
- The majority (76%) of respondents rated the quality of NYCI support as excellent or very good. 50% have found the supports extremely or very effective in enabling them to include STEAM in their practice and 57% agree they have been extremely or very effective in supporting delivery of STEAM projects that young people enjoy. Comments from those who have not found the supports to be effective cited time constraints and COVID-19 related disruption as the main reasons for this.

- The reasons respondents gave for their strong ratings of the supports relate to:
  - The level of support received from NYCI staff and STEAM practitioners and their understanding of the youth work context, and of young people's needs.
  - The quality of CPD, which modelled practical, hands-on, replicable examples of good practice, enabled respondents to engage young people and develop their own STEAM skills and the confidence to apply them in practice. Ideas for appealing, achievable, and fun projects and activities are valued.

- Project payments for equipment and advice on sourcing kits, resources and materials also enabled STEAM in youth work practice and are likely to support sustained engagement in STEAM related practice into the future.
- Respondents valued the opportunities for practice sharing, networking and connection during COVID-19 restrictions.

Impacts on the policy and practice of youth work organisations

- A small proportion of respondents (9%) say availing of NYCI's STEAM in Youth Work support services has resulted in a change in policy in their organisation, 36% say it did not and 33% say they don't know (55% didn't respond). Respondents that provided details of policy changes referred to more focus on STEAM and inquiry-based learning, and inclusion of STEAM in programmes, timetables and planning.
- The most common changes in organisational practice reported by respondents, which occurred as a direct result of availing of NYCI's STEAM in Youth Work support services, were an increase in planned STEAM activities, projects and programmes (43%) and more engagement with STEAM events, festivals and sites or centres (24%).
- 15% of respondents also said their organisation was now pursuing other funding streams or supports for STEAM.

Barriers and enablers to delivering STEAM in youth work and other non-formal education settings

- Inadequate equipment and materials and lack of access to (or awareness of) local STEAM practitioners are among the main barriers (identified by 32% and 24% respondents respectively) to delivering STEAM in youth work and other non-formal education settings.
- Inadequate facilities and space present a barrier to 23% of respondents. Lack of STEAM knowledge, skills and the confidence in using STEAM also pose a challenge for 21% of respondents.
- Other barriers described by 26% of respondents include COVID-19 restrictions and time constraints.
- Funding, CPD, project payments for equipment, project ideas and access to STEAM practitioners to assist with projects are ranked as most important in terms of support by respondents.
- There is also strong interest in practice sharing, online resources, and mentoring.

4. Conclusions and Recommendations

Conclusions

- The findings of the survey indicate that availing of NYCI's STEAM in Youth Work support services has enabled respondents to include or enhance STEAM in youth work practice in a range of projects and activities, involving 1900 young people (October 2019 - October 2020), in a diverse range of settings. The provision of project payments, resources, equipment and quality STEAM CPD is enabling integration of STEAM into youth work practice and non-formal educational settings by addressing barriers including inadequate equipment, lack of access to (or awareness of) local STEAM practitioners, and STEAM skills and knowledge.

- Feedback from the 57% of respondents (that have applied learning in the period from October 2019 - October 2020), demonstrates the effectiveness of CPD that models achievable, appealing, practical, inquiry-based approaches. The workshops provide space to develop skills and grow confidence prior to engaging young people.

- COVID-19 related restrictions have severely impeded opportunities to apply enhanced STEAM in youth work practice resulting from learnings from CPD and enhanced equipment. Despite the challenges faced, 59% of respondents report a change in their practice as a result of availing of the supports.

- Respondents are integrating STEAM into their practice with young people who are disadvantaged or face challenges and are otherwise underserved in terms of access and opportunities to engage with STEAM. The projects and activities described engage young people in a variety of settings including youth clubs and Youthreach centres, homework clubs, Direct Provision, Garda Diversion projects, mental health and family support projects. This is enabling STEAM engagement in familiar youth work settings, outside of more traditional settings (galleries, museums, school and third level institutions).

- Young people are benefitting in a range of ways from increased access and opportunity to enjoyable STEAM engagement, through practical hands-on projects and activities that allow space for co-creation, inquiry and trial and error. Respondents perceive that taking part in the STEAM projects and activities they delivered is having a positive impact on young people's engagement with STEAM as well as their learning, skills, and personal development. The majority perceive an improvement in STEAM technical skills and a range of transferable skills including creativity, critical thinking, problem solving, teamwork and communication among the young people with whom they work. They also perceive positive impacts on engagement and interest in STEAM, self-confidence and a sense of pride in their work.

- Respondents rate the quality and efficacy of the support services highly; the majority feel more confident using STEAM in their practice and say they developed their own STEAM knowledge and skills. The majority that have been able to apply their enhanced practice are using STEAM more often and for longer when working with young people, and are also using more inquiry-based approaches.
- The quality of the CPD and the support provided by both NYCI and STEAM practitioners delivering CPD was a key reason cited by respondents for rating the quality and efficacy of the supports highly.
- There is an appetite for practice sharing and collaboration with STEAM practitioners among respondents, however access to STEAM practitioners locally can be a barrier.
- There has been some change in organisational practice where respondents work as a result of availing of the supports, primarily implementing and integrating more STEAM related practice into programmes and more engagement with STEAM related festivals, sites and centres.

Recommendations

The following recommendations should be considered by NYCI in planning future capacity building for STEAM practice in the youth work sector (subject to the organisation's strategic plans and availability of resources).

- Continue to develop the model of providing a holistic suite of supports including CPD, resources and equipment to enable STEAM in youth work practice and address barriers in a way that responds to the specific needs in the youth work and Youthreach sectors.
- Include and evaluate opportunities for young people involved in supported projects to showcase and share their work in the future model of support. Events similar to the showcase event planned for September 2020 at the Science Gallery (cancelled due to COVID-19) and other online, or blended options should be trialled.
- Continue to research practitioner needs to inform planning for supports.
- Offer additional CPD courses both online and face to face, case studies of best practice, STEAM project ideas, and resources to provide opportunities to continually enhance practice and explore new STEAM themes and topics.
- Maximise the impact of the STEAM in Youth Work project at organisational levels by offering tailored CPD for youth sector managers to support them to embed STEAM as a youth work methodology within their organisations.
- The COVID-19 pandemic has necessitated new ways of connecting across the education and engagement sectors, for example, optimisation of CPD support for remote delivery and the use of video, webinars, online practice share meetings, online events, showcases and resource sharing platforms.

These formats, which offer more flexible ways of engaging, have potential to reach wider geographical audiences and should be considered in planning future support delivery.

- Facilitate and sustain the community of practice that has developed among those who have availed of supports to enable practice sharing, peer to peer support and mentoring by both STEAM practitioners and youth workers with specific expertise or experience. Regular meetings, seminars on areas of interest, guest speakers and trouble-shooting clinics with experts could be provided in response to the group's needs.

- Build capacity for connecting youth workers and STEAM practitioners at local level by exploring potential collaboration with other stakeholders in the STEAM sector such as the third level Institutions, SFI Research Centres, SFI Discover Centres, SFI Discover Primary Science and Maths Programme, STEPs to Engineering, Industry, The Heritage Council's Heritage in Schools Scheme, Creative Ireland, Arts Centres and Local Authority Arts Offices and libraries. For example, organisations such as SFI, the Heritage Council and the Sustainable Energy Authority of Ireland (SEAI) offer a range of teacher CPD, resources and pupil workshops to support delivery of inquiry-based STEM learning. Some libraries have STEAM or maker programmes.

- Organisations with a role in STEAM outreach, engagement and education can learn from youth workers' experience of engaging diverse groups of young people to increase access and reach underserved audiences, outside of formal education and beyond traditional STEAM settings. NYCI should explore the potential this offers for collaboration in the context of the STEAM in Youth Work Project.

- Promote awareness of opportunities for STEAM practitioners and the young people with whom they work to take part in National STEM Weeks, STEAM festivals, events or showcases (either online or face to face). Connect with existing organisations or networks:
  - The SFI Discover Centres Network has over 60 centres including Zoos, Aquariums, Fab Labs, National parks and Museums that offer STEM or STEAM workshops and tours.
  - SciFest is an inclusive model of science fairs in post primary schools and some other settings. The team have extensive experience and success in this area and could advise on showcasing young people's work.

- NYCI should devise and implement a strategy for measuring programme impact, on youth work practitioners and young people participating, to measure progress towards the programmes stated objectives of:
  - Using STEAM to support the achievement of youth work outcomes.
  - Deliver inspiring, experiential STEAM education and engagement projects.

This could, for example, provide guidance to youth workers on using existing tools such as Skills Summary (an online tool which enables young people to articulate, document and develop skills acquired through participation in youth work and non-formal education) and Capturing Magic (a group observational tool used by youth workers to evaluate outcomes in STEAM and Arts programmes).

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Appendix 1: NYCI STEAM in Youth Work Project Support, list of training events, equipment kits and project payments.

Support	Number of participants
STEAM in Youth Work introductory training day, Kilkenny, June 2019	11
STEAM in Youth Work introductory training day, Enniscorthy, June 2019	10
STEAM in Youthreach introductory training day, Athlone, June 2019	10
STEAM in Youth Work, intermediate training day, Carlow, September 2019	10
STEAM in Youthreach, introductory training day, Dublin, October 2019	9
STEAM in Youth Work, introductory training day, Cork, October 2019	9
STEAM in Youth Work, introductory training day, Mullingar, October 2019	5
STEAM in Youth Work, introductory training day, Athlone, November 2019	4
STEAM in Youth Work, intermediate training day, Monaghan, November 2019	6
STEAM in Youthreach, introductory training day, Limerick, February 2020	10
STEAM in Youthreach, intermediate training, Dublin February 2020	9
STEAM in Youth Work, online training, Carlow, April 2020	10
STEAM in Youth Work, online training, New Ross, May 2020	12
STEAM in Youth Work, online training, Leixlip, May 2020	5
STEAM in Youth Work, online training, Waterford, May 2020	11
STEAM in Youth Work, online training, Limerick May 2020	11
STEAM in Youth Work, online training, Tullamore, June 2020	11
STEAM School 2019, three day residential, Maynooth, September 2019	30
STEAM School 2019 Booster Day, February 2020	15
Storybuilding for Digital Projects, North West, October 2020	10
Expert Site Support Visit, Summer 2020 by Maeve Clancy	10
Expert Site Support Visit, Summer/Autumn 2020 by Brian Cregan	4
Expert Site Support Visit, Summer 2020 by TechSpace	18
Games in Youth Work: Engaging Young People in Development Education Course	12
€150 - €200 STEAM equipment project payments, Summer 2020	28
STEAM equipment kit 2020 (sent out to participants in Dub Oct 2019 training, Limerick Feb 2020 training and Cork 2019 training)	15
STEAM training, equipment and support project 2017/2018	318
STEAM in Youth Work, 2-day Introductory and Intermediate training course, Sept/Oct 2020	7
STEAM in Youth work, new online training, New Ross, November 2020	5
STEAM in Youth work, new online training, Waterford, November 2020	8
STEAM in Youth work, new online training, November 2020	8
STEAM in Youth Work, final practice share seminar, November 2020	25
STEAM partnership payments (equipment grants of between €150 - €300), November 2020	21
STEAM equipment prizes (Oculus Go Headsets), November 2020	3

Appendix 2: NYCI STEAM in Youth Work, Project Support Services Evaluation Survey

1. Please describe your role
> A youth worker (Full time)
> A youth worker (Part time)
> A senior youth worker
> A volunteer youth worker
> Not a youth worker but a member of staff of a youth work organisation
> Youth work manager
> Coordinator of a Youthreach Centre or Community Training Centre
> Teacher or resource staff at a Youthreach Centre or Community Training Centre
> Group Leader (Scouts/Guides)
> Other (please specify)

2. If you are a STEAM practitioner what is your main area of interest/expertise?
> N/A, I am not a STEAM practitioner
> Science
> Technology
> Engineering
> Maths
> Art
> Other (please specify)

3. Please tick all of the NYCI STEAM in Youth Work support services which you have availed of
> STEAM in Youth Work introductory training day (in person)
> STEAM in Youth Work intermediate training day (in person)
> STEAM in Youth Work online training
> Games in youth work CPD
> STEAM School 2019 three-day residential programme, Maynooth, September 2019
> STEAM School 2019 Booster Day, Dublin February 2020
> STEAM in Youth Work equipment Grant (€55 - €300)
> STEAM in Youth Work Residency Grant (up to €5,000)
> STEAM in Youth Work Expert Site Support Visit (Maeve Clancy, Brian Cregan or TechSpace), Summer 2020 Other (please specify)

4. Overall, how would you rate the quality of the NYCI STEAM in Youth Work support services you availed of

Excellent   Very Good   Good   Fair   Poor

Can you say why?

5. How effective have NYCI STEAM in Youth Work support services been in enabling you to include STEAM in your practice?

Extremely effective Very effective   Somewhat effective   Not so effective   Not at all effective

Can you say why?

6. How effective have NYCI STEAM in Youth Work support services been in supporting delivery of STEAM projects that young people enjoy?

Extremely effective Very effective   Somewhat effective   Not so effective   Not at all effective

Can you say why?

7. Prior to availing of the service(s), how often had you used STEAM to engage young people in a youth work setting?

Never   Weekly Monthly   Once or twice a year

Other (please specify)

8.Has COVID-19 prevented or impeded the implementation of planned STEAM projects?

Not at all   To some extent   It has prevented projects from proceeding

9. Has there been any change in your practice as a result of availing of the STEAM in Youth Work support services?

Yes   No

If yes, can you give details?

10. Thinking about the time since you availed of the supports, please indicate the degree to which you agree or disagree with the following statements:

Agree strongly   Agree   Neutral   Disagree Disagree strongly

      I use STEAM more often with young people
      I spend more time using STEAM activities with young people
      I feel more confident using STEAM
      I've developed my own STEAM skills and Knowledge
      I use inquiry lead approaches more often
      I applied what I learned in other non-STEAM related contexts

11. Did any collaboration with a STEAM practitioner to deliver a project result from availing of the STEAM support services?

      No, I have no plans to do so at present
      Not yet but I plan to collaborate with a STEAM practitioner(s) to deliver a project in the future
      Yes, I collaborated for the first time with a STEAM practitioner to deliver a project
      Yes, I developed an additional collaboration(s) with a STEAM practitioner(s) to deliver a project
      Other (please specify)

12. Have you applied what you learned through availing of NYCI's STEAM in Youth Work support services yet?

Yes   No

Can you say why you have not applied what you learned through availing of NYCI's STEAM in Youth Work support services yet?

13. Please describe STEAM or other projects delivered over the past 12 months, where you have applied the learning from the STEAM in Youth Work support services

14.How many young people have taken part in these projects?

15. What is the gender of the young people that took part?

Male   Female   Nonbinary   Other descriptor

16. In what contexts have you delivered these projects or activities? Please tick all that apply
      Youth club
      Garda Diversion project
      Youthreach or Community Training Centre
      Direct provision
      Arts centre
      Homework club
      Education project/organisation
      Family support project/organisation
      Mental health project/organisation
      Organisations working with young people from marginalised and minority communities
      Other (please specify)

We are interested in your views of the benefits to young people, of taking part in the STEAM or other projects delivered over the past 12 months, where you have applied the learning from the STEAM in Youth Work support services.

17. In your view what were the main benefits for the young people?

18. Please tick the extent to which you feel the young people developed or improved the following skills

Very much improved   Somewhat improved   No change   N/A Did not use this skill

      Creativity and imagination
      Collaboration & team working
      Critical thinking & problem solving
      Communication and interpersonal skills
      STEAM technical skills
      Learning independently
      Adaptability
      Can you identify any other skills that you feel the young people improved?

19. Did you notice any change in the young people involved in terms of the following?

Positive change   No change   Negative change

Engagement in learning
Pride in their work/tangible outputs
Self confidence
Perceptions about relevance of STEAM to their lives
Love of learning
Determination and resilience
Perceptions of STEAM careers

20. Thinking about the young people's experience of the project, please indicate the degree to which you agree or disagree with the following statements:

Agree strongly   Agree   Neutral   Disagree   Disagree strongly

The young people had a say in the project content and planning
The young people got to meet and work with STEAM practitioners
The young people took part in hands on STEAM activities
The young people had a say in the project content and planning

21. Thinking about young people's reactions to the project, please indicate the degree to which you agree or disagree with the following statements:

Agree strongly   Agree   Neutral   Disagree   Disagree strongly

It was difficult to maintain the young people's interest and engagement
The young people's perception of their own abilities improved
The young people show more interested in STEAM now
The young people have expressed an interest in more STEAM projects in the future

22. Has there been any change in policy in your organisation as a direct result of availing of NYCI STEAM in Youth Work support services?

Yes   No   Don't know

If yes, please give details

23. Has there been any change in the practices of your organisation as a direct result of availing of NYCI STEAM in Youth Work support services?

Yes   No   Don't know

If yes, please tick any that apply

More STEAM activities/projects/programmes are planned
Volunteers will have opportunities for STEAM training
Staff will be offered STEAM CPD
More Engagement with STEAM events, festivals and sites/centres
The organisation is now pursuing other funding streams or supports for STEAM Other (please specify)

24. Which, if any, of the following have been a barrier for you in delivering STEAM in youth work and other non-formal education settings? Tick all that apply

> Inadequate facilities and space
> Inadequate equipment and materials
> Lack of knowledge and skills in STEAM
> Lack of confidence in using STEAM to engage young people
> Young people's attitudes to STEAM
> Young people's previous experiences of STEM
> Lack of access/awareness of local STEAM practitioners

Can you identify any other barriers?**25. Please rank the relative importance of the following supports for you to deliver STEAM in youth work and other non-formal education settings (scale of 1-5)**

> Funding for STEAM projects
> Ongoing Professional learning opportunities
> Grants for equipment and materials
> Project activities or ideas
> Access to STEAM practitioners to assist with projects
> Practice sharing and networking opportunities
> More online resources
> Can you identify other support that you need to enable delivery of STEAM in youth work?

26. Do you have plans to apply what you have learned through NYCI STEAM in Youth Work supports when working with young people over the next year?

Yes   No   Don't know

If yes, please give details

27. How many young people do you estimate will benefit from your enhanced practice or the STEAM projects you/your organisation go on to deliver within the next year?

28. Do the young people that you have used or hope to use your enhanced practice/deliver STEAM projects with, experience any challenges, disadvantages or inequalities?
Yes   No   Don't know

29. Do you consent to NYCI using your anonymous comments for promotional purposes?

Yes No

30. If you would like to enter a free draw for an equipment grant worth €150 please provide your email address

Thanks for your time!

National Youth Council of Ireland
3 Montague Street
Dublin 2
Ireland
Email: info@nyci.ie
Tel: +353 (0)1 478 4122
www.youth.ie