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CS @Foróige TechSpace Impact Report 2018-2020





CS @Foróige TechSpace

Impact Report

2018- 2020



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Executive Summary

It is important that technology not only reaches and benefits a wider audience but is also designed and improved by a diverse group of talents. We are very proud in Camara Ireland and Foróige to have worked on this project to expand the reach of Computer Science learning opportunities beyond classrooms and into communities across Ireland. The collaboration brought together Foróige's national reach and cutting edge youth development programmes with the creative technology innovation and energy of the Camara Ireland TechSpace programme.

We set out to reach 3,000 young people by providing skills and professional development training to Foróige clubs and projects in a range of urban and rural settings and to reach a diverse group of young people. The project exceeded all expectations. An initial phase involved intensive work on the development of resources specifically designed for and co-created with youth workers, volunteers and young people. 328 youth workers and volunteers participated in the subsequent roll-out of training and support and built their new skills and confidence into programme development. During the 2 year project 3,064 young people had the opportunity to be introduced to new creative computer science activities and in the spirit of TechSpace they were inspired to create, invent and have fun. Youth work methodology supports learning by doing in fun, youth led and adult supported, try-again fail-again spaces. Computer science was a natural fit, as one young person said "I thought coding was boring and not for me... but it's not it's fun".

We are both very grateful to Google.org for making this project possible. It is only the start of an impact that will have a long story as Foróige groups continue to introduce and embed computer science to all corners of Ireland. Camara Ireland and Foróige are organisations that believe in the potential of all young people to contribute positively and actively to their own futures and to the future of our communities. We invite you to read this report and enjoy the sense of excitement and enthusiasm for opportunity and aspiration, as this is our main finding from young people who are part of the Techspace network. There are many stories of impact and positive change for young people who now see new possibilities for channelling their curiosity and energy. One youth worker from the West of Ireland said "We know we are on the crest of something great locally" we believe this is true nationally and made possible by making the space for all young people to create, invent and inspire.

Marianne Checkley CEO Camara Education Ireland
Sean Campbell CEO Foróige

01 —

Introduction to CS
@Foróige TechSpace

01 —

Introduction

CS @ Foróige TechSpace is a creative partnership between Foróige and Camara Education Ireland, proudly sponsored by Google.org to bring Computer Science (CS) education training, activities, support, events, and professional qualifications to **300 youth workers and 3000 young people** across Ireland.

It brings together the best of youth, charity and corporate sectors to develop an innovative programme that empowers professional and voluntary Foróige youth workers to embed **computer science and 21st Century skills** in their work with young people.

About Camara Ireland and the TechSpace Programme

TechSpace is an education programme of Camara Education Ireland. The TechSpace team at Camara Ireland offers training, development, support and opportunities for youth organisations and schools to deliver **STEAM and Digital Creativity projects** in their youth setting. **Camara Education Ireland** is a non-profit social enterprise with a vision of an Ireland where all young people have the skills to realise their potential and confidently create their future.

About Foróige and the TechSpace Programme

Foróige is the leading youth organisation in Ireland and has been working with young people since 1952. Foróige's mission is to enable young people to involve themselves consciously and actively in their development and in the development of society. With support from **Camara Ireland and Google.org**, Foróige TechSpaces bring **creative technology and computer science to young people**, supporting volunteers and youth leaders to inspire young people to create, invent and make with technology.

Project Objectives: June 2018 to June 2020

02—

Project Objectives: June 2018 to June 2020

Background

The **CS @ Foróige TechSpace** project was in operation from June 2018 to June 2020. It was a 2 year partnership project between Camara Ireland and Foróige, Ireland's leading youth organisation. CS @ Foróige TechSpace was funded by Google.org and designed to bring Computer Science (CS) education, training, activities, support, events, and professional qualifications to **350 youth workers and senior managers** within Foróige, impacting up to **3000 young people across Ireland**. The concept of the project was to bring together the best of the youth, charity and corporate sectors to develop an innovative programme to empower professional and voluntary Foróige youth workers to embed computer science and **21st Century skills** in their work with young people.



CS @ Foróige TechSpace Objectives

The outcomes for the Computer Science Project funded by Google.org over the 2 years were as follows:

Project Outcome	Target	Achieved
Foróige staff and volunteers trained	300	328
Senior managers trained in ICT Integration Framework	48	51
New Foróige TechSpace sites	60	92
Laptops deployed to new TS sites	360	360
Young people impacted	3000	3064
NUI Cert in Digital Creativity in Youth Work Bursaries	16	8 in 2019/20 academic year 8 for 2020/21
Training Courses Developed	3	3

Partnership

The CS @Foróige TechSpace Team

Through the partnership, two full-time National Computer Science Education Specialists were employed by Camara Ireland and based in Dublin as part of the TechSpace Programme team. In total, four part-time Cluster Coordinator positions were recruited by Foróige to support youth workers and volunteers to implement the programme and avail of the training at a regional level across Munster, north Leinster and north Connacht. The core staff team were supported by the TechSpace Programme Manager in Camara Ireland and Foróige's Volunteer Development Manager.



Camara Ireland staff had responsibility for the development and delivery of training, central support for TechSpaces, leading on the delivery of the programme content at a national level in partnership with Foróige's National senior management structures. The Foróige Cluster Coordinators promoted the project and created links to locally support youth clubs and projects. They recruited staff and volunteers for training and provided support and information to the new TechSpace sites in their area.

Work on the project began in June 2018 and focused on training needs assessment, establishing relationships with Foróige staff and volunteers and developing and piloting the initial computer science training programme.

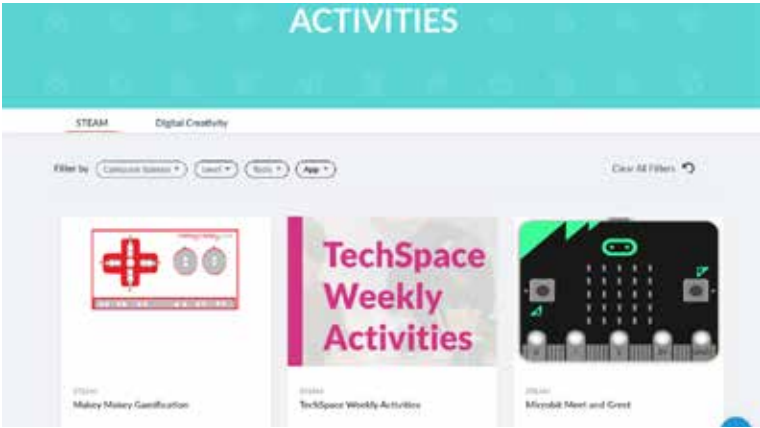
The Foróige TechSpace Network - A National Reach

Once educators were trained they became part of the TechSpace Network. Through the network, educators can access support from Camara Ireland and Foróige to help them in facilitating TechSpace activities in their clubs and projects. This can be in the form of general advice on material and ideas to engage young people or in equipment or hardware support.



The TechSpace Online Network

Educators can also sign up to the TechSpace online network where they can search for activities, share new ideas and find out information about the work of other groups and services in the network. Camara Ireland staff maintain the online network and are available for support and advice centrally.



The map represents all of the Foróige TechSpace clubs and projects that have completed computer science training and where they are based. The scope of the project in engaging educators in computer science TechSpace training was founded on already existing relationships and building new connections in the wider Foróige network.



The role of the Foróige Cluster Coordinators was essential to establishing and maintaining relationships with the educators trained through the project. This was a key element of the training delivery and sustaining functioning Foróige TechSpaces. Having regional contacts ensured that a support network was within close proximity for new TechSpaces trained in computer science.

Events

A Timeline of Events

Jun - Dec 2018

21/07/18

Dublin Maker Festival at Merrion Square - The first opportunity to meet the public and present information on the project and what it hoped to achieve.



17/09/18

CS @ Foróige TechSpace Launch at the Foróige Big Picture Youth Club, Tallaght. - Minister Katherine Zappone of the Department of Children and Youth Affairs officially launched the project.



19/10/18

Foróige Volunteer Conference in Kilkenny. Foróige TechSpace Cluster Coordinators facilitated an Intro to MicroBit session with Foróige volunteers from across Ireland.



02/11/18

Creative Tech Fest 2018 at the Google Foundry. 50 young Foróige members from CS trained TechSpaces were among the 300 attendees. 2 computer science workshops were delivered and 3 awards presented.



Jan - Jun 2019

06/03/19

ESB Science Blast at the RDS. Held over 2 days in March. Project staff from Foróige and Camara Ireland facilitated short CS & STEM activities.



14/03/19

Tech Féile 2019 in the Black Box in Galway. Project staff from Foróige and Camara Ireland facilitated a MicroBit workshop through Irish for 20 young people.



25/04/19

Foróige STEAM Showcase at NUIG, Galway. Project staff facilitated a session using MicroBit and Scratch. This was a pilot event in the Foróige calendar and was successful in bringing young people together to showcase projects and try new activities.



Jul - Dec 2019

17/09/19

National Ploughing Championships in Carlow. The project team was on hand to deliver TechSpace information and workshops. In partnership with Creative Ireland.



30/10/19

ESB Creative Tech Fest 2019 at the Convention Centre Dublin. Project staff facilitated 3 workshops on the day in Scratch & CS First, MicroBits and Exploring Conductivity through Art. 4 CS awards were presented at ESB CTF.



26/11/19 - 12/12/19

School Digital Champion Programme. The team facilitated 2 workshops per day at this Department of Communications, Climate Action and Environment run programme. Using MicroBit and Google Applied Digital Skills platform. Workshops took place in November (Sligo) and December (Dublin and Limerick).



Jan - May 2020

04/04/20

Tech Féile 2020 at Shannon Airport, Co. Clare. The team facilitated 2 bilingual workshops at Tech Féile based on BBC Microbit and Scratch. 40 young people attended the workshops on the day.



06/04/20

Syddan Foróige Club, Co. Meath. Launch of case study impact video at the local youth club. Project staff attended and presented the club with a Microbit kit for the Foróige club as recognition of their participation in the case study and video shoot.



Outcomes of the project - June 2018 - June 2020

03 — Outcomes of the project: June 2018 - June 2020

New Opportunities for Young People

3,064 146

Young People will have access to Computer Science as a result of this project

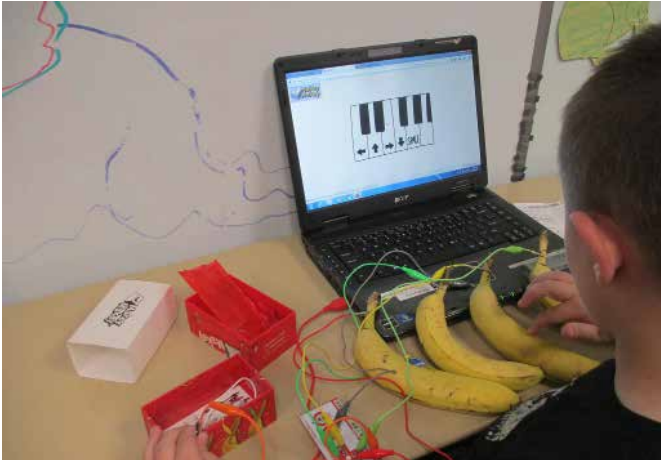
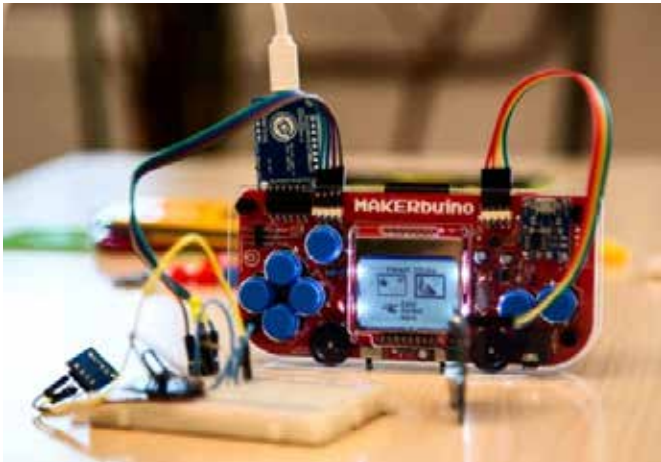
Foróige Clubs and Projects across the country completed training through the CS @ Foróige TechSpace project

92

of the Foróige TechSpaces trained were new to the TechSpace programme

54

sites had trained in TechSpace STEAM or Digital Creativity training before participating in Creative Computer Science training



Foróige TechSpace Computer Science Creative Consultants Focus Group

- 10 young people from across Ireland and their leaders participated in an online focus group in May 2020.



The focus group was based around three main areas of discussion:

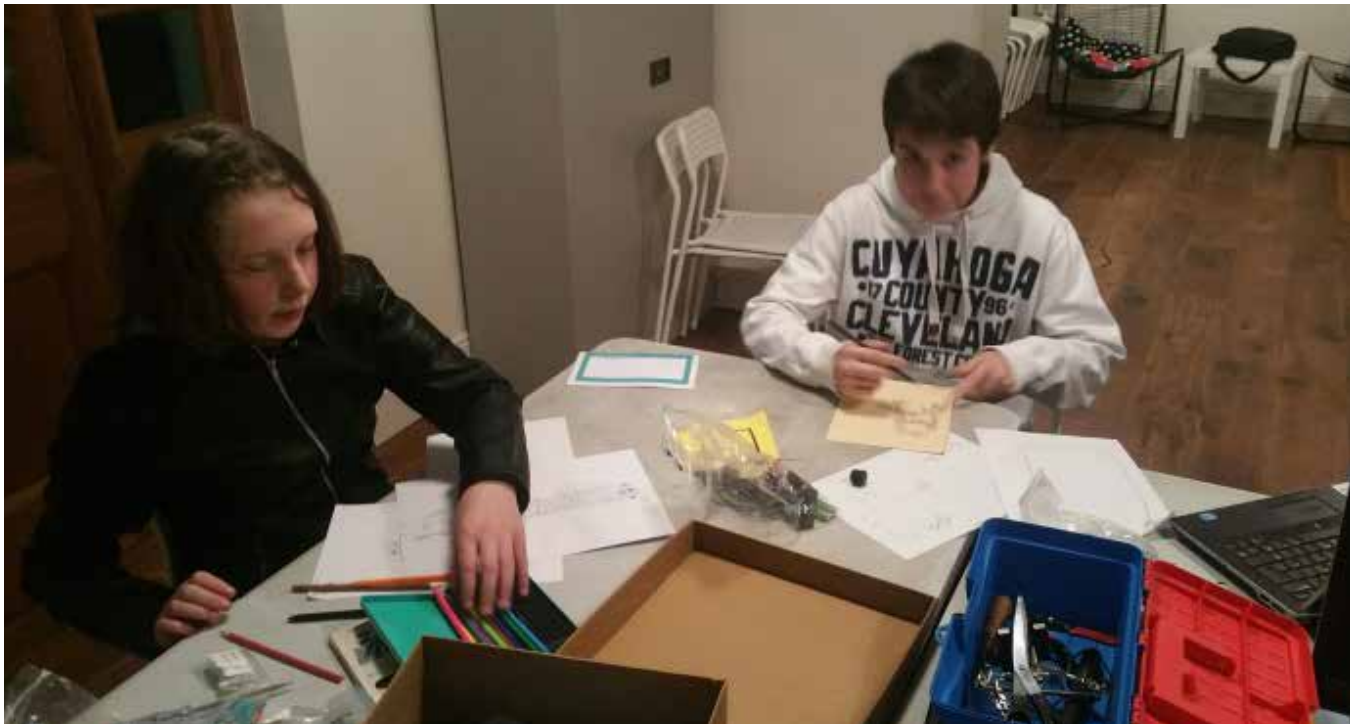
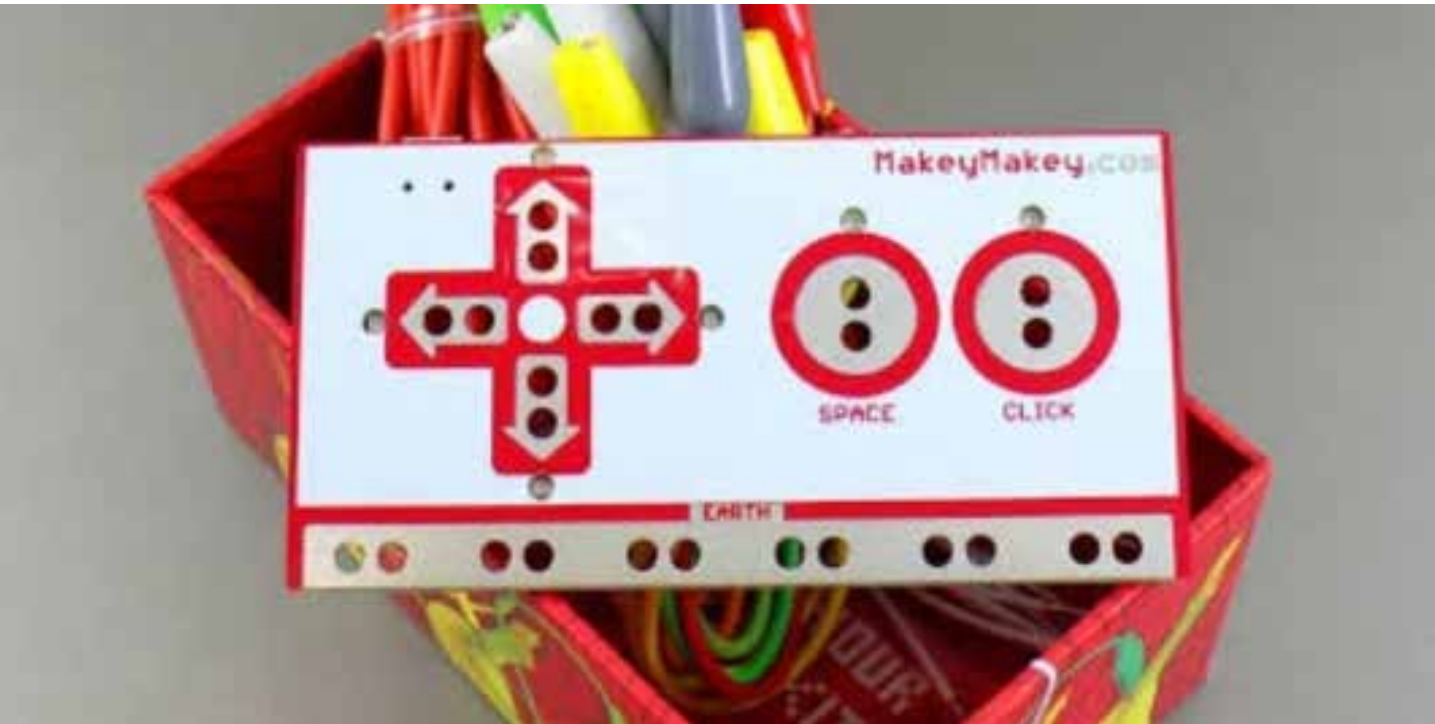
- 1. Young people's Foróige TechSpace experience to date.**
- 2. Young people's future computer science activities.**
- 3. What should TechSpace focus on for future development?**

Key talking points from the discussion are presented below:



Young people's Foróige TechSpace experience to date

- All participants had been using Scratch to create projects. The young people reported that they had been most interested in creating animations, games and music through the Scratch projects. Some had learned Scratch using Google CS First while others had been learning by essentially playing with the Scratch creator. One young person said that their group creates a lot of sprites by drawing on paper and using a scanner to upload the image to Scratch.
- Some reported their groups have expanded their experience beyond Scratch. This includes making speakers from PCB boards, putting together a PC and using MicroBits.
- Since March 2020 and the Covid-19 restrictions one group has made a platform adventure game in Scratch across Zoom by sharing a screen, coding and copying alongside peers.
- One participant noted that he really enjoyed it. Expressing that it changed his opinion on coding - he always liked computers and had done a little bit in school but he said he has learnt much more since being involved in his Foróige TechSpace club.
- The chance to try new things was a common theme in the discussion, from those with little computer science experience starting with Scratch to more experienced coders having the chance to move onto other technologies (e.g. Raspberry Pi, Arduino, etc.)
- Minecraft came up through discussion as a game that some of the young people had been using in their TechSpaces. One group made a replica of a castle in their locality using Minecraft.
- Gaming was discussed as a good way to get young people involved and interested in computer science.
- Throughout this early discussion, creativity was touted as a key part of the learning for the young people. Using coding and the computer as a creative tool was something that they came back to a number of times.
- One young person spoke about not knowing how to turn on a PC - "started from 0". Now he teaches his mum how to use Scratch and knows how to code himself.



Young people’s future computer science activities

- All reported that they wanted to keep up computer science and wider TechSpace activity in their Foróige club.
- Young people in 6th class are hoping to pursue computer science as a subject in secondary school.
- One of the young people would like to do computer science as a second level subject but was unsure if it would be available as a subject in their new school.
- Some of the young people said they would consider it for a career once they had finished school.
- One young person is moving into senior cycle at secondary school and is considering computer science for third level studies.



What should TechSpace focus on for future development?

- Keep using Scratch as a starting point
- One young person said they were advanced in Scratch and done it for a few years and would like to do something else.
- This came up for a number of young people, Scratch is enjoyable but they wanted to try something more challenging.
- Python was mentioned by one young person as a possibility, this young person had already made a website using python.
- Raspberry Pi was another area that the young people identified as something they would be interested in.
- Exploring Robotics was highlighted as a cool idea.
- Online challenges - There was some interest in games, making a game to play together and work together.
- The group expressed an interest in being involved in events such as ESB Creative Tech Fest.

TechSpace Showcase Opportunities



ESB Creative Tech Fest 2018

300

young people attended the ESB Creative Tech Fest 2018 at The Google Foundry, Barrow Street, Dublin 2

50+

young people from Foróige TechSpaces attended

2

computer science workshops - Scratch with Google CS First and the BBC MicroBit

3

computer science awards were presented to young people

After the workshops there was time for an exhibition of computer science activities and young people had the opportunity to showcase their MicroBit robot projects in a series of challenges.





ESB Creative Tech Fest 2019

404

young people attended the Creative Tech Fest 2019 at the Convention Centre Dublin

100

of those young people were from Foróige TechSpaces

4

Computer Science Awards were presented on the day

3

Computer Science Workshops - Scratch with Google CS First, BBC Microbit and Conductivity with Scratch and Makey Makey

What Did the Young People Think?

“I rated today excellent because I have learnt something new and it was a fun experience”

“I liked it a lot for the fact that there is a lot of workshops to do”

“I thought it was great team-bonding”

“It was really fun because I got to learn about lots of things”





An Annual Network Celebration

ESB Creative Tech Fest is an annual celebration event for the **National TechSpace Education Programme, with over 1,000 young people aged 12-18**, invited from across all counties in Ireland to take part. Youth workers and teachers from the TechSpace Network are supported to facilitate young people to showcase their creative technology projects and take part in inspirational workshops, talks and exhibitions.

A Programme of



Kindly supported by





2020 Called for a Digital Evolution of the Event

Initially in May 2020, The TechSpace team met with 51 Cluster Coordinators to establish the challenges faced by youth workers and Gaelscoileanna in order for them to meet the needs of young people. On the 28th of October 2020, young people logged in from home or attended local zoom calls with youth workers and educators to view a youth award ceremony and tour a national virtual reality ESB Creative Tech Fest exhibition gallery.



1K

Digital Creativity party packs provided to young people

689

Young People reached nationally through an live online award ceremony event

54

organisations took part on the day from 20 Counties

350

Young People from the Gaeltacht took part

131

Youth Organisations were supported across Ireland

20

Award Categories from across STEAM, Digital Media and Computer Science



New Skills For Educators

The Target for CS @Foróige TechSpace Project funded by Google.org was **300 new Foróige Educators** to be trained.

328

Foróige Staff and Volunteers trained by Camara Ireland

22

Counties involved

- Creative Computer Science Training
- Introduction to Scratch and CS First
- Computer Science and BBC Micro Bit
- Computer Science and Raspberry Pi

8

Foróige Digital Creativity Specialists

- Participated in a level 8 certificate programme with National NUI Maynooth, with a further 8 to be enrolled for 2020-2021

51

Senior Managers were engaged

- To develop a Foróige TechSpace Digital Learning Plan template for projects and clubs to embed digital competencies into their youth service delivery.





CS Training And Learning Outcome Analysis

Three training courses were developed as part of the project:

1. **The Introduction to Scratch and CS First** was piloted in June 2018 as the initial introduction to computer science for Foróige educators.
2. **CS and the BBC MicroBit** was launched in September 2019 and is targeted at educators who have completed the introductory training.
3. **CS and the Raspberry Pi** was developed through winter 2019. Elements of this course were piloted in December 2019 with participants of the NUI Certificate in Digital Creativity and through workshops at Tech Féile 2020 in Shannon Airport.

Training Hopes

Here's a sample of what educators said prior to training:

“ I’m interested in the appliance of CS for children with Learning Disabilities.”

Foróige Volunteer, Co. Clare

“ Don’t have much of an idea about CS and how to use it in a youth work setting so this training will be hugely valuable and am delighted to be able to take part.”

Foróige Youth Worker, Co. Donegal

“ I’m looking forward to training. I think it is a great way of introducing STEM opportunities to young people.”

Foróige Youth Worker, Cork

“ We hope to use volunteers with IT skills & young people themselves to enhance Tech opportunities in the youth project.”

Foróige Youth Worker, Cork

Training Feedback

Listed below are samples of what educators had to say after CS training:

“ I enjoyed the interaction between everyone involved. Also the slides and presentation were very good. I enjoyed the hands on approach to learning. It was very interactive with participation from all those involved”

Foróige Volunteer, Cork

“ It was broken down very well, was made feel that it wasn’t as scary as I first thought!”

Foróige Youth Worker, Co. Galway

“ Facilitator was very good at keeping participants engaged. No complicated language. Very approachable. Really enjoyed it and looking forward to learning more.”

Foróige Volunteer, Co. Wicklow

“ I liked the variety of the resources and how easy they are to access and I liked the instructions.”

Foróige Volunteer, Co. Tipperary

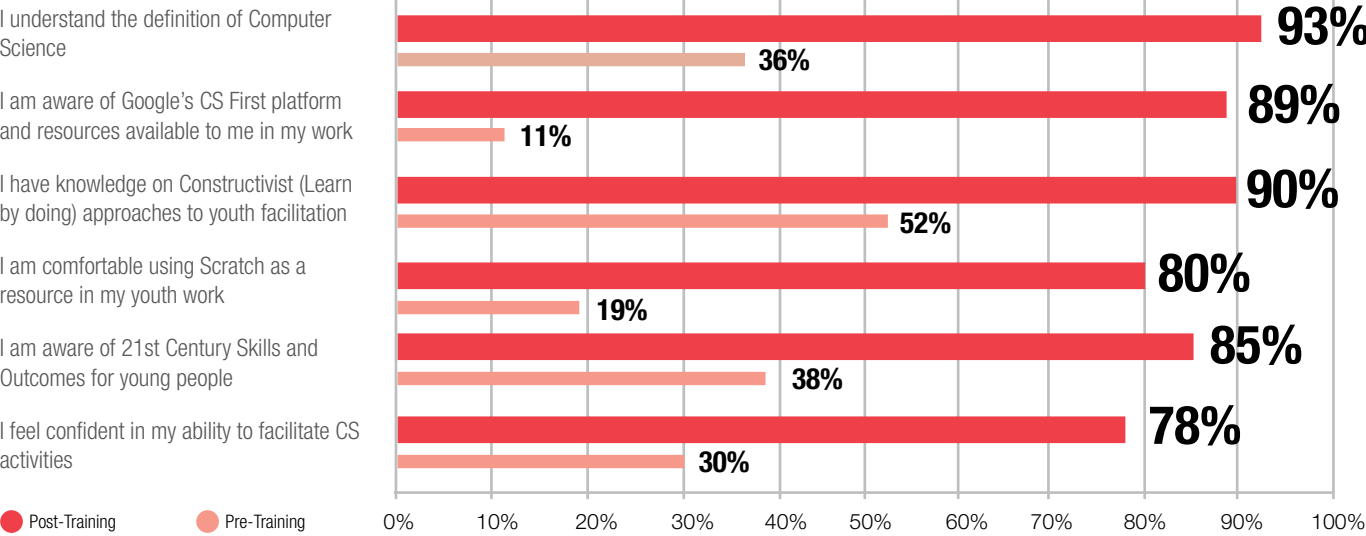
Pre and Post Training Survey Results

Participants completed pre and post-training surveys at all training courses. The surveys were used to evaluate each session and to measure impact and learning outcomes. A self-rated Likert Scale of 1 (Strongly Disagree) to 5 (Strongly Agree) was used to quantify educators’ knowledge and skills before the course. Educators answered a follow-up survey with identical questions after training. In addition, the post-training survey carried further statements and questions to evaluate the training delivery.

A Comparison of Knowledge, Skills and Confidence

Comparing pre-training and post-training responses to the survey statements, when scoring a 4 (Agree) or 5 (Strongly Agree), the results were as follows:

Survey Statement



Observations

Comparing the survey data shows a clear improvement in the knowledge, skills and confidence of the Foróige Volunteers and Staff regarding computer science.

Understanding of what defines computer science was low in the initial survey. During training discussions many participants defined it in terms more related to computer literacy (i.e. the knowledge and ability to use computers). Post training understanding of what computer science is increased with explanation of the distinctions between CS and computer literacy.

Before training, most participants were unaware of where to access computer science lessons and resources. Just 11% of respondents had heard of Google CS First. Access to online resources and support was noted as a key factor in enabling Foróige Volunteers and Staff to run computer science activities in their clubs and projects.

The Constructivist theory of learning is an integral aspect of informal education in youth work and there was good knowledge and practice of this process among the participants. Foróige Volunteers and Staff adopt a learn-by-doing approach to learning in their groups. Reinforcing this helped to devise a familiar model of how to facilitate computer science activities with young people.

Post-training 80% said they felt comfortable using Scratch in their youth work and 78% said they felt confident to facilitate computer science activities after training. This indicates that a sizeable number of participants still lacked confidence to deliver CS activities after training despite the resources and support available.

Understanding the 4 C's (21st Century skills) helped the participants frame the outcomes of the project for young people in terms of their progression and development of new skills and knowledge.

Training Delivery Evaluation

After training participants were asked additional questions about their impressions of the training course and their plans for introducing Computer Science to the Foróige clubs and projects they worked in.

When scoring a 4 (Agree) or 5 (Strongly Agree), the results were as follows:

98%

of participants said they would recommend the training to other Foróige staff and volunteers

98%

said they felt their Hopes and Fears were addressed in the training

86%

said they planned to facilitate Computer Science in their youth setting

95%

said they knew what the programme was about and how it was relevant to their work

On a scale of 1 to 5:

95%

rated their experience of training at 4 or 5

91%

said the pace and flow of the training helped their learning

97%

rated the presentation and resources as a 4 or 5



04 — Development & Future

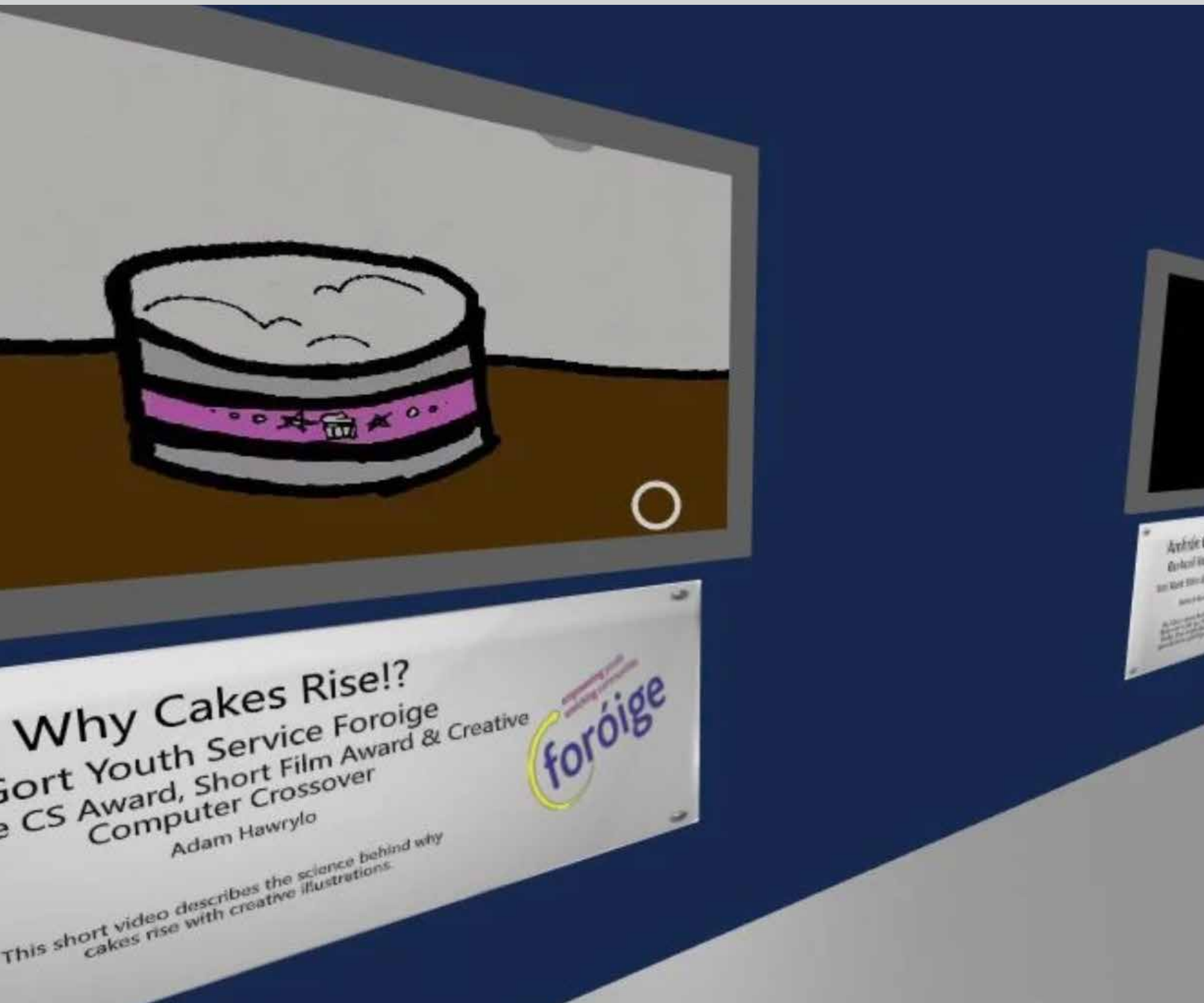
Innovation

Curriculum Developed

Introduction to Scratch and CS First

The introduction to computer science training was developed using a combination of data based on the needs analysis among youth workers; monitoring of the latest developments in digital youth work practice; and research into computer science curriculums in both schools and informal settings. The relatively recent introduction of Computer Science to the Irish school curriculum has left us behind many contemporary European countries in computer science education. Bringing computer science into youth organisations can introduce young people to a fun, collaborative way to learn that will complement the formal education computer science curriculum.

Camara's Introduction to CS training uses Scratch, Google's CS First platform, CS Unplugged and more to teach the fundamentals of computational thinking and coding. It is designed to remove confusion about computer science and enable youth workers to facilitate sessions that can focus purely on computer science or combine with the other STEAM subjects.





CS and the BBC MicroBit

The second training course was launched in September 2019. It involves further exploration of the societal impacts of computer science as well as introducing youth workers to the BBC Microbit. The Microbit is an affordable and powerful programmable circuit board which is very well suited to both informal education and curriculum based models. Research involved a deep dive into the impact Computer Science can have on society; a topic which is particularly prevalent in today's world. The training aims to explore the way young people consume technology and how best to facilitate these interests in a youth work setting. This includes research on modern gaming habits, and how they can be integrated into an informal learning programme.

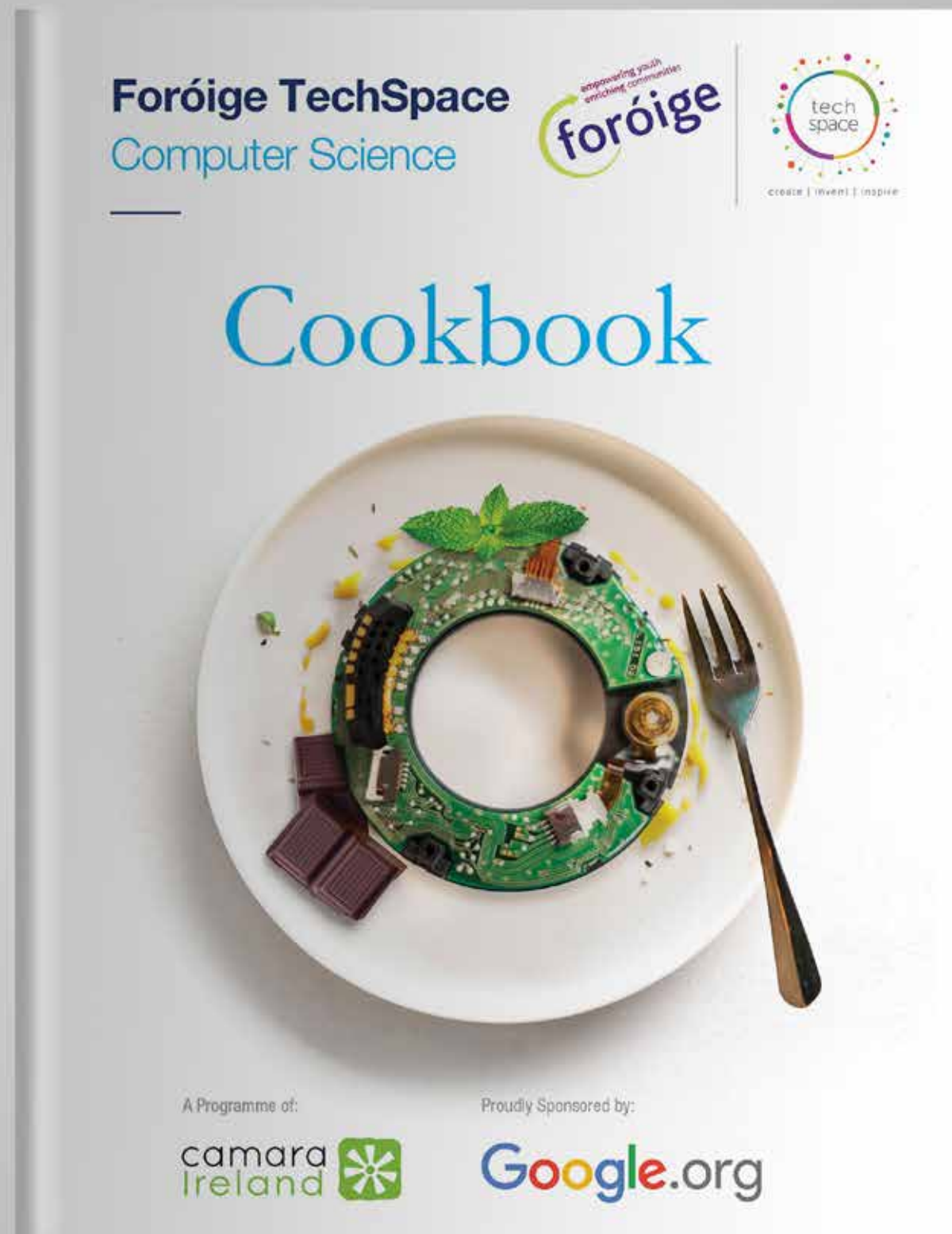
Discussions with experts led to an approach which focused on the fundamentals, while encouraging people to approach computer science as a part of the wide remit of the STEAM subjects. This course encourages a better understanding of computer science and its relevance to a multi-disciplinary curriculum. This is essential to empowering youth workers with the tools to deliver STEAM activities in an informal and educationally beneficial manner.



Scratch, Gaming and the Raspberry Pi

The third training course developed incorporates 3 main topics; gaming, further exploration of Scratch and an introduction to the Raspberry Pi. Gaming and engaging young people in youth work through games has increasingly been discussed and highlighted in recent years. One section of this course is dedicated to introducing youth workers to gaming and gaming concepts. This is achieved by using a CS Unplugged approach through developing board games that can later be adapted to a computer science project.

The second section of the training is based on creating a Scratch project for youth groups to engage in which ties together elements of computer science and STEAM. The third section introduces the Raspberry Pi. The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. Youth workers are guided through setup and installation of the system. The final session consists of practicing some computer science and STEAM activities using Raspberry-Pi.



Foróige TechSpace Computer Science Cookbook

The Foróige TechSpace Computer Science Cookbook was developed to present a toolkit of activities and tips for facilitating computer science in youth work.

The approach adopted was to make activities available to follow as step by step guides while also providing space for the educator to adapt them and develop their own activities and ideas.

This was encapsulated in a design that is intended to mimic a traditional cookbook where the recipes are presented fully formed but also includes space for the reader to add their own twist to the printed instructions and document their own recipes.

Inside the book there are tips and activities to help run computer science activities in Foróige clubs or projects. These guidelines are lessons that have been fed back from the youth workers and volunteers who have been working in Foróige TechSpaces on computer science from 2018 - 2019.

Sustainability

Case Studies

Axis Youth Space, Louisburgh, Co. Mayo

Axis Youth Space is a volunteer led Foróige club aimed at senior Foróige members (aged 15-18). Foróige volunteers at the club took part in computer science training in Castlebar in May 2019. The club had planned to introduce TechSpace with an idea in mind that older members (aged 16-18) would work on TechSpace activities with Foróige Youth Leaders. Following this initial work, in a peer-learning initiative, the older teens would then mentor junior group members (aged 12-15) in computer science and STEAM. The leaders reported confidence that this approach is a positive development for their club pointing to support from Foróige and Camara Ireland through training and introduction to online resources, equipment and projects.

Initially, November 2019 was outlined as the start date for the TechSpace club at Axis Youth Space and at this time the Foróige volunteers also participated in TechSpace STEAM training. However the leaders still faced one major hurdle to starting their Foróige TechSpace. They did not have a permanent venue for the club. While this was being explored they enlisted the help of senior members and introduced TechSpace activities to them alongside their regular weekly meetings. This group of senior members would be a pilot TechSpace group with the intention that they would be able to help deliver the programme to the younger members that follow behind them.

This approach was working well. With the older teens they spent a number of weeks researching, planning and practicing. Some time was then spent on trying to secure a home for their TechSpace locally. Unfortunately they hadn't been long into this work when Covid-19 struck and the new restrictions on meeting and movement would not allow the volunteers to pursue this avenue in the immediate future. As the club timetable follows the school year, it effectively meant that the club would be closed until at least September 2020.

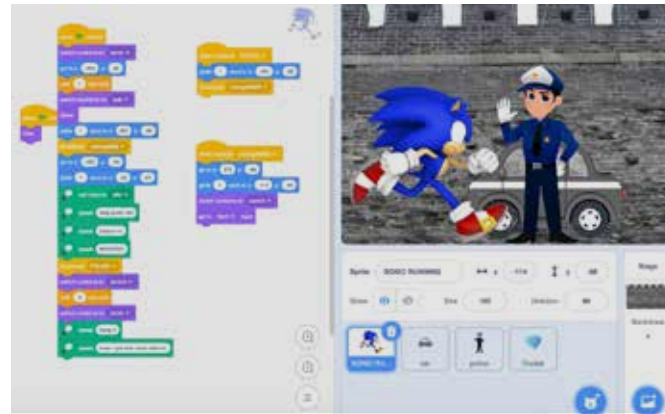
At present the club meets through online calls. With regard to their TechSpace work, they are waiting until they, and the young people are physically on-site to resume these activities. They do intend, however, to carry on their planned approach and they feel that once the club gets back to normal they will be in a strong position to relaunch their Foróige TechSpace.



“ We know we are on the crest of something great locally and given a little more time, we feel our approach will all work out in the end.”

Some examples of Axis Youth Space Leader's feedback

“ Since our training we've become more and more interested in the world of TechSpace and STEAM. Our minds have almost been 'rewired' to look at things a different way, for example an old tv is no longer just an old tv, it's an opportunity to open it up and explore with our members how it's made or it can become a useful tool when making holograms. We now see small things around us in our everyday lives and have the knowledge and motivation to create projects for our group.”



The Kabin, Hollyhill, Cork

The Kabin Studio at Hollyhill on the north side of Cork City is a non-profit community space that has grown out of a love for hip hop, original music, and more recently, horticulture. They believe in a holistic approach that includes the facilitation of music workshops, the recording and production of original songs, and the nurturing of a community vegetable garden in a neglected urban setting surrounded by social housing.

Foróige volunteers at the Kabin have been trained through the CS @ Foróige TechSpace project and began Foróige TechSpace activity with a pilot project summer camp in July 2019. Weekly workshops started in September fusing a coding group with a rap, songwriting and beatmaking group. This helped to increase computer literacy amongst participants as most don't have laptops or PCs at home. In addition to the TechSpace work in Cork, Garry facilitated 2 music technology workshops at the ESB Creative Tech Fest 2019 in Dublin's Convention Centre.

Being located in the Kabin Studio, the young coders were able to use other music-related technologies such as drum machines, midi keyboards, DJ decks and podcasting equipment.

Due to COVID-19, the tutors and young people are now using online platforms such as Google Classroom, CS First, Zoom and Soundtrap for producing and recording music.

Songs recorded at these workshops have been performed at public events like 1 Billion Rising in Cork City, at a UCC lecture about youth music programmes in Cork and recently one of the tracks was premiered on Cork's Red FM.

The plan for the future of the Kabin is to further develop the studio as a space that can deliver workshops in video, web, graphic design and transition it from a youth music space into a youth multimedia creative hub. There is an interest from young people to explore activities related to electrical engineering and robotics. To incorporate all of this, the tutors aim to expand the program and engage more young people in STEAM activities at the Kabin.



Lismore Foróige TechSpace, Co. Waterford

Lismore Foróige TechSpace club meets weekly at a dedicated youth work premises known as the Blue House. It is a volunteer-led TechSpace that has a number of leaders, all of whom have backgrounds in technology and science careers. Four Foróige Volunteer leaders participated in training in Cork at different junctures from June 2018 and have been successfully running their TechSpace from September of that year. This is a new TechSpace, started - in part - due to the support and encouragement of the local Foróige team and regional Cluster Coordinator to participate in that initial computer science training. In the time since, the volunteer leaders have also completed TechSpace STEAM Training and the second computer science course CS and the BBC Micro Bit.

The group comprises 10 young people aged between 10 and 14 years and they have worked on a wide range of projects and applications since they've been together. Some examples of these are; using Scratch to create games and animation, robot building, graphic design, taking apart old PC's and hardware, and STEAM projects. The club received laptops from through the CS @ Foróige TechSpace project. They have also applied for and been successful in gaining various grants to expand their equipment in order to enrich the young people's exposure to various technologies.



“ I enjoy learning new stuff and watching the club members get satisfaction and a sense of achievement from what they are doing in the club.”

“ Getting to work with the kids, sharing some knowledge and experiences I have acquired over the years and giving back to the community.”

“ I got involved with Techspace because I wanted to engage with and contribute something to the local community and at the same time help my own personal development.”

“ Probably my favourite single impact on a young person was observing one successfully do soldering for the very first time. Overall it has been nice to see the members gel as a group and acquire a group identity.”

The Catanators, Dublin 1

The Catanators is a new Foróige TechSpace which started out in May 2019. The TechSpace began with a team of industry volunteers who completed the Foróige TechSpace computer science training. The volunteers were recruited and supported by the regional Foróige TechSpace Cluster Coordinator at the time. Following the call out for interested young people there was a great response from young people in the area. In particular 6th class students from Central Model NS on Gardiner St.

In the initial 2 months of the group, the creative coding sessions took place in the National College of Ireland. It proved a very comfortable and accessible location for the new coders, most of whom could walk to the NCI from school. The group responded well to the Google CS First modules and displayed a real appetite for creative coding activities. With over 15 young people attending during the first 2 months, the group split up for a summer break.



Resuming the following autumn and now supported directly by Foróige staff the group began with a new location in the local SWAN youth centre. They picked up with more creative coding activities, introducing BBC Microbit into some sessions. Attendance had remained strong with requests from more young people to join but unfortunately the numbers were restricted due to room size and the limitations of the equipment available to use.



During the autumn sessions, the group decided to begin working on their creative coding submission for the ESB Creative Tech Fest. At this point, there was evidence of peer to peer learning and support with young people actively sharing their coding knowledge and ideas with their friends.

At ESB Creative Tech Fest 2019 the club had a winning submission which was a positive boost for all of the members. Zuzanna, aged 12, was one of the first participants at the Foróige TechSpace and learned Scratch through the club using Google CS First as a learning platform. Zuzanna created her own stories using Scratch and a character named Mr. Air who has now starred in 3 animations and one action game. She was the recipient of the Creative Computer Science award at ESB Creative Tech Fest 2019 for her work on this project.

Moving to early 2020 the TechSpace group developed their weekly sessions into a technology/NFTE group - NFTE is the Foróige Network for Teaching Entrepreneurship - adopting a new group name, The Catanators. They aim to use their tech skills to shape innovative ideas that could help their community. The group meets weekly in Foróige's HAY project in Summerhill and the Catanators are aiming to continue their learning and fun. They have also requested pizza on a regular basis to help with the thinking process!



Syddan Foróige Club, Co. Meath

Syddan Foróige Club in Co. Meath is a volunteer-led Foróige club that meets every Friday evening. The club has been in operation for over 20 years and has approximately 50 participants each week. These young people are split into Junior and Senior groups. The Foróige club is a big part of the local community and is well supported. The leaders have incorporated computer science into their work with young people as a result of taking part in training back in December 2018. As a rural club, they are based in the local GAA hall and currently have no access to wifi or broadband.

The Foróige volunteer leaders draw on their own skills and the skills of other community members to facilitate activities for young people. Through initial contact from their regional Cluster Coordinator, three Foróige volunteers participated in computer science training and the club has successfully run a Foróige TechSpace since. This is in spite of the lack of broadband infrastructure. While this inhibits some of the possibilities to engage in digital activities, the club has managed to work around this difficulty. For example, the leaders have run Scratch programming sessions offline using hard copies of Google CS First activities.

While TechSpace is not the sole focus of the club, there are a number of technology based sessions built into the plan for the club. Each week the group will work on different topics that are of interest to the young people involved. This is often guided by engaging particular people in the community who have specific skills or interests to come along and work with the young people at the club. Some of the current volunteers have backgrounds in tech and science industries and are able to bring their own experience and skills to the TechSpace work with young people.



Members of the group submitted Scratch projects for and attended the ESB Creative Tech Fest 2019 in Dublin and this was noted as a particular highlight of their participation in the project. To help with facilitating tech sessions, the club has 6 laptops from the CS @ Foróige TechSpace project and young people bring along devices that they have at home to make sure that everyone has access to the programme at hand.

Some examples of the Syddan Foróige Club leaders' feedback

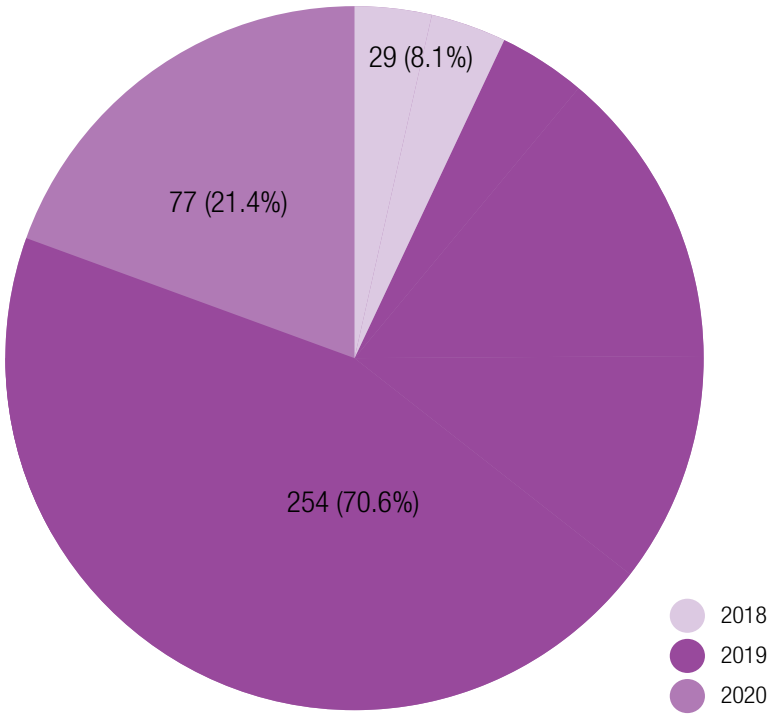
“ We went to Tech Fest with 7 of our members from the club. It was a fantastic day out - I’ve never been to one, but it was unbelievable from start to finish.”

“ ...on a Friday night you have something to look forward to. You can come and see your friends without the pressure of school and rules and do things you might not ever get the chance to do.”

Hardware

Over the course of the project the Education Officers in Camara and Foróige’s regional Cluster Coordinators offered fundamental IT support for youth workers to enable them to deliver computer science education and training content. This could be as simple as setting up passwords or, in some cases, helping to solve more complicated hardware issues. In total 360 laptops were deployed to 72 TechSpace sites over the 2 years.

CS Project Hardware Deployment



2018

29 laptops were deployed to 7 Foróige projects and clubs.

2019

254 machines were delivered to 49 Foróige projects and clubs across the country.

2020

The remaining 77 laptops were distributed to 16 Foróige projects and clubs.

Foróige TechSpace Grants

In order to strengthen the sustainability beyond the project end in May 2020, it was decided by the project partners that any budget surplus would be allocated to a small grant fund for Foróige TechSpaces. The grant was open to volunteer and staff led Foróige TechSpaces and was intended to provide them with a way of funding necessary equipment, resources or training required to carry out TechSpace activities.

The stipulation was that grant spending must be used to begin or enhance TechSpace activity with young people. Examples of possible areas of grant use: Equipment, Training, Software Licenses, etc.

34 Foróige Clubs and Projects received a small grant of almost €600 each

Examples of the reasoning for application from groups:

- To purchase more laptops.
- A/V equipment for presentation and showcase
- Engineering and MOJO (mobile journalism) kits
- 3D printers
- Electronic components
- MicroBit kits
- Laser design

From the detail of the applications it was clear that Foróige TechSpaces are combining various elements of technology education in their work with young people. This is evidenced in the way Foróige TechSpace engineering groups are allying computer science activities with ‘Maker’ type activities. Getting a small grant and having access to the new equipment means that there will be more opportunities and a wider range of activities available to young people for the future of these new Foróige TechSpaces.



Foróige TechSpace Digital Learning Plan



Youth organisations and non-formal learning spaces are changing the way they reach and support young people. Youth workers and educators are looking for ways to effectively use technology enhanced services that support their work. Over the past two years, a series of information sessions were held to engage Foróige Senior Management in the development of a Digital Learning Strategy template for Foróige projects and clubs.

The strategy is informed by the initial needs analysis and feedback from Foróige staff and volunteers. It is adapted from the work of the *Skill IT - Digital Pathways for Youth Work* Erasmus+ project hosted on www.digipathways.io.

The Foróige TechSpace Digital Learning Plan is a document that accounts for and summarises the recommendations of all stakeholders (young people, staff, volunteers, senior managers and sponsors) in a youth project or club. In order to plan how best to digitise and enhance technology activities as a Foróige youth project or Foróige club, the template outlines actions based on the research conducted with everyone involved in day to day activities. As part of the Foróige TechSpace programme, these guidelines have been created for managers and club leaders in Foróige to develop a detailed action plan to improve the use of digital technologies in their youth work.

The plan is informed by 5 key steps:

1. **Young people's consultation and recommendations. Guidelines and templates have been created to help this process.**
2. **Assessing the Digital Readiness of the project or club. This process is led by management and takes a high level view of current capacity for technology in the work of the team.**
3. **Staff and volunteer consultation and recommendations. Online tools and guidelines are available to help progress this stage.**
4. **Hardware and technology audit. Gathering information on resources to hand and how they are being used at present.**
5. **Finalising and implementing the detailed action plan, informed by steps 1 - 4. This can be achieved by using the Foróige Digital Learning Plan template.**

A range of resources are available through Camara Education Ireland and Digipathways.io to enhance each step of the process and can be tailored to suit the specific needs of participating Foróige clubs and projects.

05 — In Conclusion

Key Learning

Educator's Confidence

There is a sense that — as widespread facilitation of STEAM in youth work is a relatively new development — there is hesitancy around the integration of computer science as an activity when compared to more traditional activities (e.g. sport or art and craft).

Some educators reported a lack of confidence to facilitate computer science activities even after completing training.

Anecdotal and pre-training survey evidence suggests that many volunteers and staff believe that they lack technical competence and have a perceived deficit in learning digital skills. The degree of difficulty in facilitating computer science was considered even higher than facilitating digital media or hands-on, practical STEAM activities. This seems to be one of the main factors in educators either not signing up to training in the first place or not delivering computer science activities post-training.

Equipment & Funding

A backlog of equipment orders from 2018 meant that some new Foróige TechSpace sites were later getting started with computer science activities. Some sites reported lost momentum as a result of a longer waiting time than expected. The problem was resolved in early 2019.

Even after laptop allocation some educators have highlighted that accessing other equipment due to funding constraints can be a barrier. Some also reported being unsure of what equipment they should invest in. Some new Foróige Clubs don't have access to the physical resources required to run Intro to CS workshops with young people, leaders and/or parents.

Connectivity

Some Foróige clubs and projects meet in venues that have poor or no internet connectivity. This presents issues in using technology such as Scratch and MicroBit Online platforms.

There is also a perception that young people could be at risk when using the internet. Online safety workshops could be helpful in these instances.

Training Recruitment

A number of scheduled training sessions were cancelled/postponed in Autumn/Winter of 2019 and early 2020.

Timing was cited as a reason for people not being able to commit to training.

Despite an emphasis on CS @ Foróige TechSpace training providing a framework for educators of all experience to facilitate computer science activities, some educators seem to have made their minds up that it's not for them. Others have pointed to a perception of computer science as an activity that is too difficult for them to deliver or of interest to the young people that they work with.

TechSpace Site Maintenance

Staff and volunteer turnover impacts on TechSpaces offering CS as an activity to young people.

For a variety of reasons trained educators move on (temporarily or permanently) from clubs and projects. Skills are lost and CS activities are at a standstill.

Some sites reported it has been beneficial for the facilitation of CS to have volunteers and staff with prior technical experience involved in TechSpace activities with young people.

Time

A challenge for volunteers and youth workers is time they feel they need to spend on becoming familiar with the technology. This development time is difficult to include in already busy schedules for volunteers and staff alike.

Covid-19 Restrictions

The COVID 19 pandemic and the subsequent restrictions on social interaction have had a big impact on the youth sector. While the project training delivery to staff and volunteers was adaptable and delivered online with relatively little disruption, Foróige TechSpace clubs could no longer meet in their youth settings. Where possible, groups were meeting and working online. This highlighted two key issues in delivery of youth work off-premises.

Firstly, the variances in resources (volunteers, staff, equipment, ICT infrastructure, etc.) available to individual clubs and projects. Some of the Foróige projects were equipped well enough to be able to move their work online. However, many Foróige TechSpaces, particularly those in volunteer-led clubs, did not have the advantage of the time or equipment required to facilitate this.

Secondly, young people's lack of internet access or availability of devices and technology at home excluded many from online youth work. Clubs and projects did their best to work around these limitations. Some were able to loan out equipment, for example. However, these initiatives could not sustain the same level of engagement for young people as when they were attending their Foróige club or project.

Recommendations

For Youth Workers

Engage with computer science and STEAM

With the training of new TechSpace educators and positive participation in Foróige clubs and projects, the CS @ Foróige TechSpace project has established a solid base for computer science in youth work.

Continued engagement in computer science and STEAM through sustained programmes, scheduled activities and showcase events can ensure that Foróige TechSpaces capitalise on the skills and knowledge of their youth workers and volunteers.

Be open to discover new skills

Informal learning opportunities open new avenues of exploration for Foróige TechSpaces. Foróige volunteers and staff can avail of many opportunities to brush up on skills. Often this is led by listening to the specific interests of young people. It involves some commitment from the youth worker or volunteer to learn but there are a myriad of supports available in-person and online. For instance, online sources such as YouTube carry vast amounts of tutorials and explanations on specific and often specialised technology topics.

Foster Peer Learning

Peer cooperation can significantly increase the capacity of groups for sustained learning experiences. Peer learning provides leadership opportunities and connection through shared interests. Young people have ownership of their groups and the projects they work on, maybe also teaching the adults in the room some new tricks. Employing the skills and interests of group members widens the collective knowledge base, increasing the range of learning opportunities for all involved.

Encourage Play and Curiosity

The Lifelong Kindergarten group at MIT Media Lab develops new technologies, activities, and communities to support young people in creative learning experiences. The philosophy underpinning that work states that people of all ages must learn to think and act creatively and to do that we should focus more on imagining, creating, playing, sharing and reflecting. Much like young children do when they are in Kindergarten.

The impact of changes in technology in recent years has been immense. By encouraging young people to work on activities and projects using problem solving, creativity and imagination, we can help them to develop and refine essential skills for the modern world.

Take Part in Engagement Opportunities

Opportunities and incentives should be available for groups and young people to have regular access to computer science learning and chances to create new projects.

ESB Creative Tech Fest is a yearly event allowing young people to submit projects for specific awards. In previous years this meant that there was just one opportunity to submit a project in the year. As part of the programme in 2020, a new initiative allocated prizes for monthly awards. This created new openings for young people to submit projects for ESB Creative Tech Fest. It proved to be a success - encouraging early and consistent submission of projects - and will continue to be a feature of the ESB Creative Tech Fest programme in the future.

Providing this and other regular chances to take part and see the work of other groups will help to encourage new learning and recognise the work of young people and Foróige youth workers and volunteers.

Further Training and Qualifications

Confidence to facilitate computer science was identified as a key challenge for Foróige staff and volunteers. This highlights the difficulty of learning new skills that are part of a vast subject area through a short training course. While participants are made aware of comprehensive curriculum and resources through TechSpace training, key skills and knowledge in computer science demand time and practice.

A sustained model of training for youth workers and Foróige volunteers interested in specialising in computer science similar to the NUI Level 8 Certificate in Digital Creativity could be one way to address this confidence gap.

For Organisations

Capitalise on Local Skill and Experience

Some of the groups that participated in the programme benefited from volunteers and staff who had a background in technical study and careers. Their expertise was reported as being extremely valuable in facilitating technology activities. The value of their input helped young people and other staff and volunteers. Conversely, some of the tech-maestros reported that they learned much from the young people they worked with. Sourcing and engaging people with skills and experience fosters community participation and models possible career opportunities for young people through fun technology group work.

From Training to Action

One of the key learnings, is the need to ensure that once participants are trained they have the resources to start the programme quickly. Long gaps could lead to a possibility of repeating training and the need for re-motivating groups to get started. Successful implementation of the programme happened soon after training when participants are most informed and prepared. For future training the hardware and equipment support should be in place before or as soon as training is completed to enable groups to get up and running straight away.

Complete a Foróige TechSpace Digital Learning Plan

The Digital Learning Plan is a tool to help a Foróige club or project take a strategic, whole organisation approach to embedding digital and STEAM technologies in their practice. It works as an evaluation tool to assess the organisation's current digital youth work and provides a framework to develop a plan to progress their digital youth work capabilities. Once completed each Foróige Club or project will have a clear and comprehensive plan of how to move forward with digital youth work informed by all of the stakeholders of the club.

Multiple Participation Options

By using technology young people can participate in computer science in youth work in a variety of ways. They can meet face-to-face or online with peers. They can collaborate on projects with people they've never met in-person. Work can be done simultaneously or asynchronously from home or in their Foróige TechSpace.

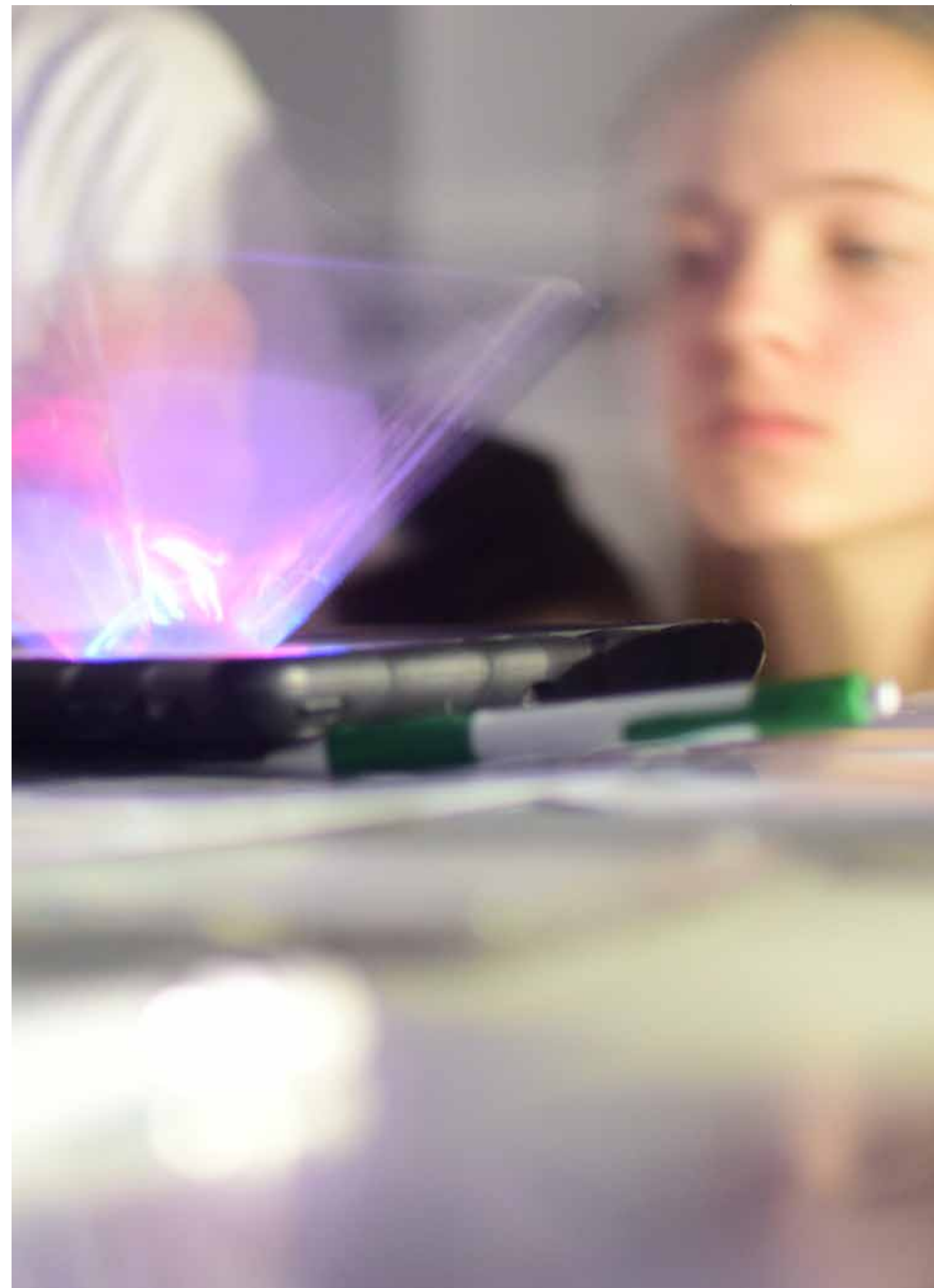
Offering a variety of ways to get involved and encouraging participation - particularly during the Covid 19 pandemic and the changing contexts of social contact - is important and could provide a vital social outlet to a young person.

Get Connected

Connectivity was highlighted as an issue for many of the Foróige TechSpaces engaged in the project, particularly those based in rural areas. ICT infrastructure improvements with the launch of the National Broadband Plan should enable Foróige Clubs and Projects to address the connectivity issues highlighted. While the infrastructure will be in place in the near future, groups will need support - financial and practical - to get connected to a broadband provider. For the development of computer science and STEAM in youth work, getting Foróige TechSpaces connected should be high on a list of priorities in all areas where there is currently poor or no broadband service.

Revitalising Equipment

In the interest of sustainability, it is imperative to ensure that the new TechSpaces developed are equipped to continue after the project has ended. New equipment and funding can be difficult to come by but resourceful groups can find ways to overcome these difficulties. Recycled materials and machines, small grant funding — local, national and international — and equipment sourced at competitive prices ensure that young people can access a wide range of technologies and new activities. The shared knowledge and experience of the wider Foróige TechSpace network can be a great source of information for groups looking for resources and the best places to find them.





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