

MUINÍN CATALYST FINAL REPORT

August 2021



FUTURE PROOFING FOR A JUST TRANSITION

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1.0 EXECUTIVE SUMMARY

The global challenges we face demand alternative systemic approaches with a real commitment to making equitable change, at the local and global levels. We will need to develop innovative systemic responses that build capacity across all levels of society. Muinín CATALYST (MC) for Education, focused on developing a curriculum resource and Continuing Professional Development Programme for second-level education that fosters 21st Century skills, by building on two-years evidence-based results from CoDesRes [1] and initial research, 'Imagining Iveragh' developed through the Living Iveragh [2] Project.

The Muinín CATALYST for Education, is underpinned by a systemic methodology and inclusive design process and is in line with Ireland, the European Union and global strategic policies, agenda and legislation. Muinín Catalyst catalysed the Sustainable Development Goals, and the 2030 Agenda through place-based STEAM education, forefronting social, environmental and economic resilience in combination with innovation, ethical and equitable entrepreneurial skills.

Additionally, Muinín Catalyst aimed to scale from onset and looked to sit within Ireland's National Education System and augment the existing senior cycle.

[1]CoDesRes: *Co-Designing for Resilience for Rural Development using Peer-to-Peer knowledge networks and STEAM Place-based Learning Interventions* www.codesres.ie

[2] *Living Iveragh* - www.iveraghinspires.com



Alberta Education, "Inspiring Action"



TO DATE, OUR RESOURCES ARE IRELAND'S ONLY INTEGRATED, PLACE-BASED STEAM EDUCATION, SDG-ALIGNED PROJECT, AND INQUIRY-BASED LEARNING RESOURCES THAT HAVE BEEN TESTED UNDER RESEARCH CONDITIONS.

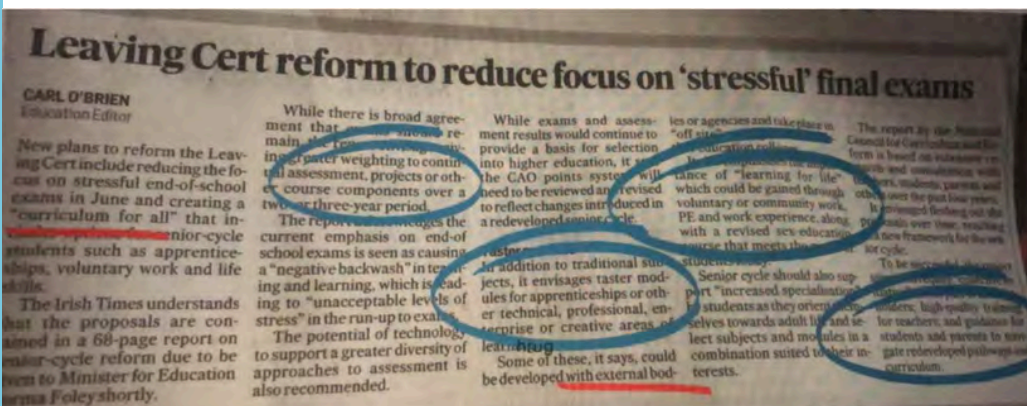
MUINÍN CATALYST

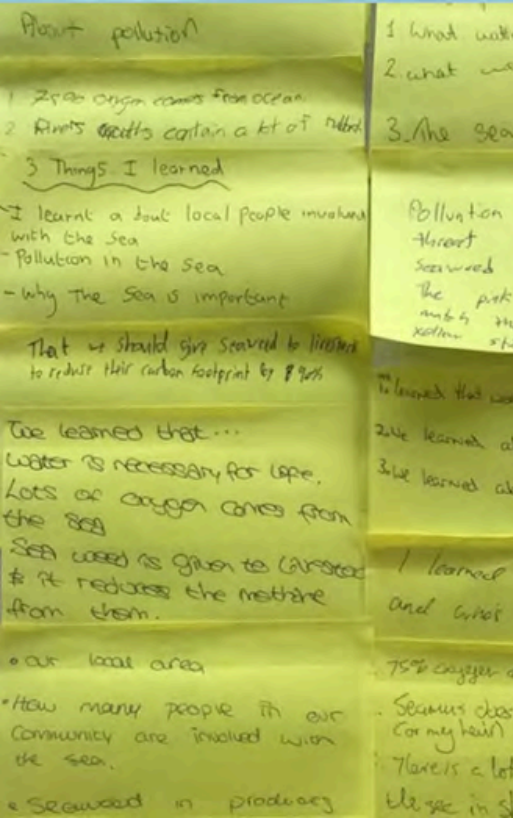
Situated in Transition Year (TY), the first year of the Senior Cycle, MC seeks to utilise the opportunities within TY, which can be summarised as:

- TY has no standard curriculum and varies from school to school.
- The aim of TY is to develop the experience, resilience, and awareness of the student. This sits well with CoDesRes' educational aims; to augment the National Curriculum with future-ready skills and raise awareness of the SDGs and the implication for future work and life.
- Teachers are keen to implement project and enquiry-based learning, but many of the project resources are not scaffolded and require tasks that assume expertise or need more input from the teachers. Teachers select 'off the peg' resources, which can be difficult to implement e.g. form a team to create an effective awareness campaign and produce a short film.
- Students and teachers with a high-status exam-focused perspective can struggle to see the benefit from an approach that will not 'tell the student what they need to know'.
- Introduction to the application of knowledge in different contexts, research developments, and discussions around future challenges and opportunities, which are not covered in the national curriculum can be foregrounded here.

We envisage Ireland as being a global leader in the area of 21st Century Education. As a small island nation, we can design and deliver national pilots relatively easily with a data set that is large enough to evidence real impact.

After outlining some of the key highlights, the report presents a brief review of the original proposal's aims, a summary of the resources produced, dissemination, and a summary of the key learning including next-stage recommendations.





2.0 HIGHLIGHTS

- Mentored and taught through COVID lockdowns and restrictions.
- Developed additional integrated modules (lesson plans, teachers guides resources and students worksheets) supporting challenge-based, solution-focused enquiry through SDG aligned place-based STEAM pedagogy.
- Presented our work to Jeremy Wrenn (Technology Enhanced Learning Officer) and Ann O'Dwyer (Director of Schools, Youth & Music) at Kerry ETB.
- Built relationships with ETB and Kerry ETB confirmed re: support of county rollout of beta programme of resources with 8 schools, their TY co-ordinators and students - funding pending. Plans to work alongside Kerry ETB's new Sustainability Officer.
- Formalised our Continuing Professional Development (CPD) - Kerry Education Centre for teachers in-service CPD and internationally at the International Transdisciplinary Conference (Switzerland).
- Supported Teacher and Students - SEAI One Good Idea. Student team were selected for regional finals and won school 'Green Award'.
- Presented the project at the Doha Teaching & Learning Conference (Qatar), AMPS (UK), Ireland International Conference on Education, with upcoming presentations at the Royal Geographic Society (UK) and International Interdisciplinary conference, Switzerland.
- Presented to the Green Party Education Policy Working Group
- Journal publications in AMPs (Architecture, Media Politics Society) and the International Journal of Cross-Disciplinary Subjects in Education (IJCDSE), both peer-reviewed.
- Submitted next stage funding applications



ONCE AGAIN, THIS YEAR I'D LIKE TO TAKE THIS OPPORTUNITY TO THANK YOU FOR YOUR SUPPORT AND GUIDANCE AND INDEED INVALUABLE EXPERTISE IN YOUR WORK WITH OUR COLLEGE. OUR SHARED INTEREST IN PROMOTING COMMUNITY HEALTH AND RESILIENCE AND EDUCATIONAL STRENGTHS AND OPPORTUNITIES WAS NEVER MORE IMPORTANT THAN THE CHALLENGING TIMES WE NOW FIND OURSELVES IN...

PRINCIPAL, COLÁISTE NA SCEILGE





3.0 OVERVIEW OF OUTPUTS



Students- 306



Teachers 9 CnS Teachers over 2 years and shared resources with 5 teachers in other schools



7 p/t Local Hires - 6 as faculty, 1 Administrator

Online CPD events -



- Tralee Education Centre May rescheduled to Sept
- WISE teaching and Learning Event, Doha
- InterDisciplinary Conference, Switzerland

2 Conferences



- Ireland's International Conference on Education
- Royal Geogrpahic Society

Outreach Social media

It should be noted that social media posts are also pushed out through CoDesRes' / A.Mckeown and Rebecca White's networks expanding the reach.

Facebook
Instagram
Twitter
Linkedin

Muinín Catalyst	CoDesRes
105	326
136	278
147	349
35	1118



AS A SCIENCE TEACHER I AM USED TO TEACHING SUBJECT MATTER AND GETTING STUDENTS TO LEARN THE IMPORTANT POINTS AS THEY MIGHT COME UP IN THE TEST BUT I THINK USING THE DIFFERENT METHODS AND RESOURCES AIDS TEACHING AND LEARNING IN A NUMBER OF DIFFERENT WAYS AND AFFORDS THE OPPORTUNITY FOR ALL TYPES OF LEARNERS TO ENGAGE AND CONTRIBUTE. I HAVE LEARNED LOTS OF NEW METHODOLOGIES.

EXTRACT FROM TY SCIENCE TEACHER FEEDBACK, COLÁISTE NA SCEILGE



IF THE ABILITY TO SEE NEW POSSIBILITIES IS FUNDAMENTAL TO CREATING INNOVATIVE DESIGNS, PRODUCTS, CITIES OR BUSINESS STRATEGIES, WHAT DO WE KNOW ABOUT STATE-OF-THE-ART POSSIBILITY THINKING?"

LIEDTKA AND FRIEDAL ROTMAN
MAGAZINE WINTER 2008:15

4.0 FINANCE

Muinín CATALYST for Education, was originally proposed for 1 year, Sept. 2019 / May 2020. A number of factors, including COVID-19 restrictions meant that year 1 was cut short. The team reviewed the budget including match funding that could be realised from the CoDesRes budget, which enabled the team to extend the programme into a second year - May 2021. Year 2 was focused on testing the resources developed were possible and adapting existing resources for delivery.

Funders Appendix 1 supplementary financial report showing full income and expenditure.

5.0 ORIGINAL PROPOSAL

Muinín CATALYST for Education, focused on expanding a suite of curriculum resources and a Continuing Professional Development Programme for second-level education that fosters 21st Century skills. The project catalyses the Sustainable Development Goals 2030 Agenda through place-based STEAM education in national education; forefronting social, environmental and economic resilience through innovation, ethical and equitable entrepreneurial skills. The Muinín CATALYST programme aimed to support future-ready teachers and learners to be responsive to the challenges of the 21st Century through inspiring creative and critical thinking. We proposed to do this by

- Providing STEAM place-based education curriculum and CPD resources to students and teachers locally and nationally.
- Develop innovative, ethical and equitable entrepreneurial skills.
- Champion an integrated approach to education that forefronts social, environmental and economic resilience.
- Develop expanded educational activities within community contexts; locally, nationally and internationally
- Intervene into the broader education ecosystem to contribute to systemic change.

6.0 DELIVERY

Our delivery was built on an agile methodology. Despite the challenges we strategically and tactically intervened into the educational ecosystem through the following areas: teaching; student activities; GAISCE; Green School; ad-hoc opportunities and work experience, which we now address in this section of the report. The project was built on the work of CoDesRes, by adding value through the ability to continue this work, which in turn supported the Muinín Catalyst project to run for two years rather than the initially proposed one year. As match-funding, this importantly offset the impact of the Covid-19 pandemic and the timetabling issues in the academic years 2019 / 20 and 2020 / 21.



IT'S MUCH MORE REWARDING WHEN THE STUDENTS ARE INTERESTED AND ENGAGED AND IT REALLY HELPS TO HAVE RESOURCES TO PUT THIS SCAFFOLDING IN PLACE. IT ALLOWS THEM FREEDOM TO EXPLORE THEIR IDEA WHILE ALSO KEEPING THEM ON TASK.

EXTRACT FROM TY SCIENCE TEACHER FEEDBACK, COLÁISTE NA SCEILGE

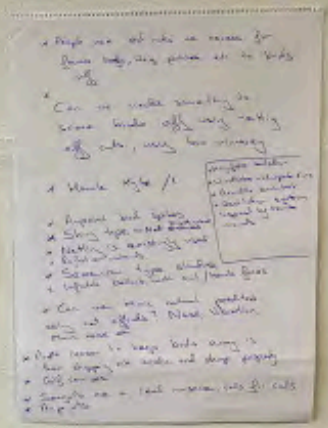
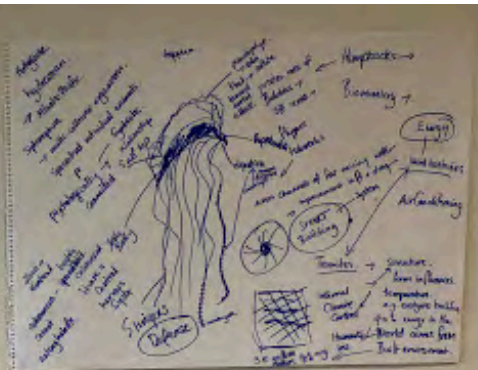
The project began in Sept 2019 and in the first term we worked with 5 teachers, across 8 subjects with 205 students. Plans in place to continue the work after Christmas onboarding an additional three teachers were impacted as previously reported, by the late decision to hold the TY musical in Jan rather than December. Further impact occurred due to the half-term, the annual two weeks work experience, followed by the GAISCE Cappanlea trip, which resulted in no delivery in February. Work again beg. of March, with a number of projects and activities planned for the final 12 weeks, including a 3-day workshop and our Future of Work (FOW) event. In our three-day workshop, our plan was to design and build an Internet of Things dashboard with students to monitor school heating and lighting, this and the Future Of Work (FOW) event were both cancelled due to the first Covid-19 shutdowns. Both events are proposed for the first term in the academic year 2021 / 22

The school's transition to online learning highlighted some of the issues that Muinín Catalyst was devised to address. Few teachers, that trained before 2014 will have had much experience or training in project or enquiry-led teaching or blended learning, or even online learning which requires different delivery skills. Two of the teachers continued to use our resources during the last term, in year 1, however, the three proposed to begin projects despite taking the resources did not progress. We hope to bring them on board in the new academic year.

In addition, during year one we were able to hire three local faculty to support the development of content and delivery under the direction of the project's co-directors, in preparation for year two. In year two we also hired a local landscape architect / designer, to work with the students and the team to co-design a 1KM health and well-being trail.



1km Health and Well-being Trail, student teams plan



6.1 Development Aims

- Develop place-based STEAM modules of work for Transition Year students.
- Trial and test modules of work through teacher and student feedback, observation, recordings, and team-teaching.
- Begin to expand the toolkit to address the other 17 goals beyond the CoDesRes suite of modules aligned with SDG 4,11,14 & 15.
- Explore ad-hoc GAISCE, Green School, and Work experience opportunities, to test aspects of the programme
- Utilise work experience
- Develop proposed Modules: Explore SDG 2,3, 7, 9, 11, 12, 13, 14, 15, 17 and Climate change through Industry Innovation and Infrastructure, Responsible Production and Consumption; Food Security; Internet of Things / Sensor building; Health and Well-being.

6.2 Place-based STEAM

The Muinín Catalyst Project developed a series of modules, to promote interdisciplinary, place-based STEAM learning and expand the existing suite of resources. The latest resources are two year-long projects, DREAM designs, repurposing derelict buildings, and Seeding Sustainability, with two options; a generic food sovereignty and sustainability module, The Ice Cream Olympics, and the specific, Coláiste na Sceilge's adapted version, the creation of a 1km health and well-being linked walking trail.

The modules have been designed to develop confidence and competence using project-based and inquiry-led approaches to create SDGs challenge-focused, solution-driven learning-by-doing. Activities are scaffolded across three learning phases:

- Research and Development
- Experimentation and Exploration
- Implementation and Maintenance including exit strategies

to support and encourage student-led learning. These activities are delivered across 7 different micro-module themes and subjects through blended learning and place-based STEAM (Science, Technology, Engineering, Arts and Maths). Longer-term, once trialled, this template will be adopted with the development of new over-arching project resources that support the learning of key challenges for our times.



...IT WAS GREAT TO SEE THE LEVEL OF DETAIL INCLUDED WITHIN THEIR LESSON PLANS AND THE OUTLINE OF THE SDG'S WITHIN EACH MICRO-MODULE MAKES IT MUCH EASIER FOR US AS A SCHOOL TO REACH OUR TARGETS IN TEACHING STUDENTS ABOUT THESE FACTORS.

TY GEOGRAPHY TEACHER FEEDBACK, COLÁISTE NA SCEILGE





6.3 Module overview

DREAM Designs and Seeding Sustainability are project-based learning modules with a year-end focus. They are tailored to use students' local places to enable them to gain knowledge and skills around contemporary sustainable development issues on a local scale, as well as project management and execution. The overarching year-end event guides lessons and related module support and encourages linked-learning. A forward-planning guide enables teachers across subject areas to collaborate and plan in order to develop learners' understanding and skills to complete the module.

DREAM Designs



Seeding Sustainability



Due to engagement with specific classroom teachers, the project aim for Seeding Sustainability pivoted towards a 1km walking and wellbeing trail that the school wanted to create. We continued working with the geography teacher on this project and have completed initial design stages and ideas. The school is keen to continue this project - funding pending and we have submitted a number of funding applications to continue with Colaiste na Sceilge, our host school and beyond - Next Stages section.



...I HAVE FOUND WORKING THE TEAM TO BE EXTREMELY RESOURCEFUL THROUGH-OUT OUR PROCESS OF ENGAGING WITH MY TY GEOGRAPHY STUDENTS. THEY HAVE A MODERNISED VIEWPOINT, WHICH HELPS CONNECT WITH THE THOUGHTS AND FEELINGS OF THE STUDENTS WHEN WORKING WITH THEM

EXTRACT FROM TY GEOGRAPHY TEACHER, COLÁISTE NA SCEILGE



6.4 Overview of All Resources

The Muinín Catalyst created a specialised Design Thinking curriculum, using a tried and tested methodology for local-level intervention that contributes to social, environmental and economic resilience. By building on prior research, the proposal presents a pedagogical programme that integrates 21st Century Skills that are relevant to local and global strategic agendas and the challenges we will face in the future. The current toolkit is aligned to the Sustainable Development Goals and integrates place-based STEAM learning into the Transition Year programme to provide additional support to teachers and students. The resources provide practical learning activities that support students and enable teachers to deliver place-based STEAM, project and enquiry-based learning into their classrooms.

The resources have been designed to be delivered within a number of contexts, range of timetables, commitments and interests. Teachers can collaborate across subjects to deliver full projects as linked learning activities, select a micro-module or utilise lesson plans to augment their own planned activities. Maximum flexibility and agility was one of the key design principles within the curriculum design, which integrated the feedback from teachers and students, from our various trials.

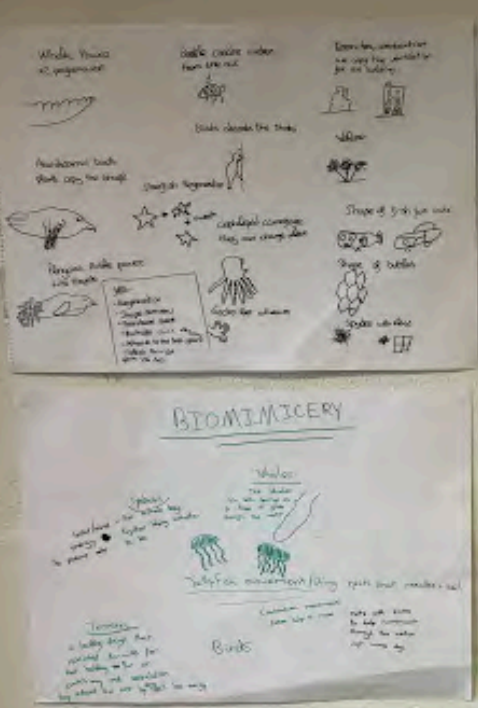
The current curriculum includes:

Sustainable Development Goal	Module descriptor
SDG 4 Quality Education Problem to Pitch	<ul style="list-style-type: none"> · Introduction to Design Thinking – 8 lesson plans, resources and worksheets developed to support
SDG 4 Quality Education Media Communication	<ul style="list-style-type: none"> · Introduction to audio-visual communication 15 lesson plans, resources and worksheets <ul style="list-style-type: none"> ○ Moving Image ○ Audio ○ Presentation ○ Graphic Communication
SDG 4 Quality Education Supporting skills	<ul style="list-style-type: none"> · Supporting skills – Leadership, Enterprise, Report Writing, Data Gathering – lesson plans, worksheets and resources · Eco-literacy linking entrepreneur and leadership skills · Upcoming - Digital Literacy
SDG 11 Sustainable Cities and Communities	<ul style="list-style-type: none"> · DREAM Designs - year long project 7 micro-modules ave. 8 lesson plans per micro-module - see image ref
SDG 14 Life Below Water	<ul style="list-style-type: none"> · Ocean Literacy – 10 lesson plans, resources and worksheets · Problem to Pitch – Marine Plastic Waste
SDG 15 Life on Land	<ul style="list-style-type: none"> · What is your Waste Lesson plan and resource · Know your river Lesson plan and resources · Seeding Sustainability, 7 micro-modules ave. 8 lesson plans per micro-module - see image ref



CREATIVITY IS THE ACT OF BRINGING INTO BEING WHAT DOESN'T YET EXIST, OR OF TRANSFORMING WHAT DOES EXIST INTO A BETTER VERSION OF ITSELF

CREATIVE IRELAND 2018



6.5 Evaluation

MC was evaluated using a 3-2-1 method; (three things they learnt, two things they would like to know more about, and one comment on their overall opinion of the class or improvements they would make to the class.

Examples of student responses, three things you learnt;

- Empathy, prototype, creativity
- Design, needs for people, how to design using small places
- How to design things using what you have

Two things that stood out;

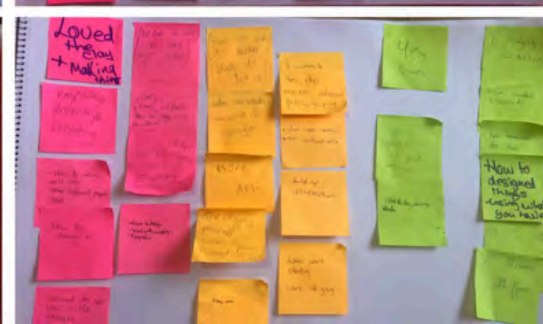
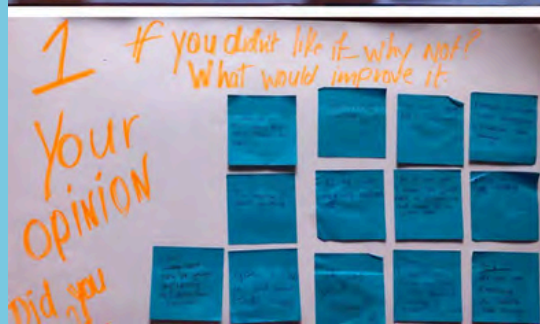
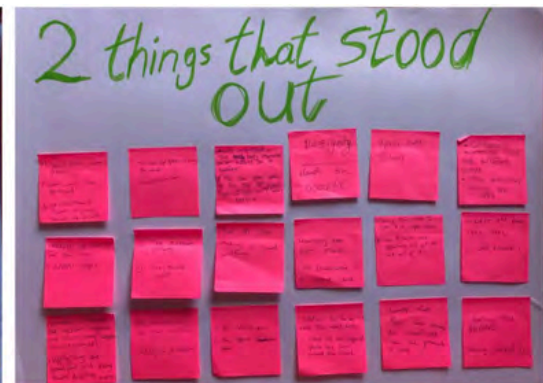
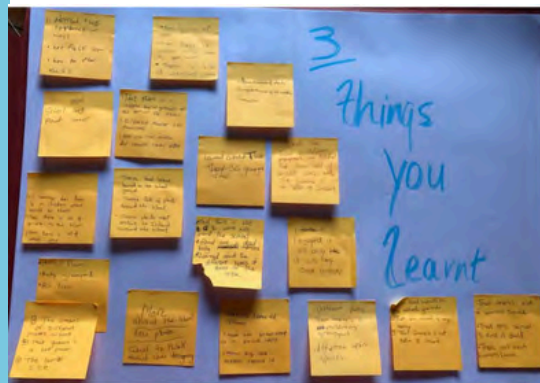
- Design is part of everything
- Learning about native plants and their names and importance

The final evaluation criteria, one thing about their opinion, encouraged students to say if they liked it and why and if not, one thing they would do to improve the lesson.

- It was very interesting and I learnt new things.
- Yes it was good. I realised the school needs to be brightened up and needs to be looked after.
- Loved it, it was really interesting and I learnt new things.

The MC programme encourages the 21st Century Skills – the 4Cs: communication, critical thinking, collaboration and creativity, through active, hands-on learning and participation.

This evaluation method supports the development of the learners' reflective skills, as well as giving them agency over the direction of their learning. The teacher can adapt the resources and facilitation of the lessons based on learner feedback.



THANK YOU FOR AN AMAZING TWO WEEKS OF WORK EXPERIENCE.

HONESTLY, I REALLY DID ENJOY THESE TWO WEEKS.

I WISH FOR ALL THE PROJECTS TO WORK OUT. THANKS FOR HAVING ME

TY STUDENT, WORK EXPERIENCE AS PART OF AN INTERDISCIPLINARY RESEARCH TEAM



6.6 Leverage existing programmes

- **Utilise the Green Schools Programme for cross-curricular programming and 21st C skills / place-based learning.**

As part of the process of integrating 21st skills and competencies aligned to sustainable thinking, we took over management of the Green School programme. The programme works towards flags that are awarded on meeting key objectives. Every two years, a school will take on a new flag, but must also maintain its previous flags, for Colaiste na Sceilge the new flag was 'Global Citizenship - Marine Health', an important area and SDG focus for a rural, coastal community. For MC this then also provided an opportunity to explore aspects of social and environmental enterprise as well as engage students on a local level with potential SMART Blue-Green Economy initiatives. The maintenance flags were: Litter and Waste; Energy and Water.

We began developing the required programmes of work through supporting students to form committees, develop action plans and encourage them to implement them through support from ourselves in meetings and the newly formed Staff Green team, which we also contributed to. Skills include project planning and implementation, surveys, mind-mapping, communication (verbal, written and graphic) as well as introductions to understanding sustainable development. Additional Green School focused work is undertaken by TY students e.g. beach cleans.

We were also able to develop a partnership with the local Tidy Towns group and a programme of work, some of which we could not initiate due to the Covid - 19 restrictions. However, we hope to support this work next year as this will facilitate our supported in-service learning programme, matching students with real-world challenges through local organisations.

Highlights from the Green School programme within the school include:

- X4 Green school student committees and Microsoft teams group (15 students all years)
- A Green school staff committee
- Plastic reduction through the installation of water fountains
- Initiation of crisp recycling, conscious cup and 'flush' campaigns in year 1
- 3 beach cleans and climate action week
- X 250 native trees were planted as part of the Seeding Sustainability trail work.

The team submitted the school's application and supporting evidence and undertook a virtual visit in June and were awarded their new flag, with an official flag-raising to take place in Sept.



I AM DELIGHTED TO INFORM YOU THAT YOUR APPLICATION FOR YOUR GREEN FLAG HAS BEEN SUCCESSFUL. YOUR ASSESSOR AND THE TEAM AT GREEN-SCHOOLS WERE VERY IMPRESSED WITH YOUR APPLICATION, CONGRATULATIONS!

GREEN SCHOOLS MANAGER,
ENVIRONMENTAL EDUCATIONAL UNIT



The school will start its new flag 'Global Citizenship-Travel' in Sept. 2021, timely due to the local South Kerry Greenway initiative's approval. Green School enables us to support students with our place-based STEAM resources through tangible local challenges within their education e.g. Leaving Cert. Agricultural Science research project (food waste, low carbon food, food miles / SDGs in food transport) as well as low carbon SMART farming.

In addition to the Green School programmes, the MC team were able to help the school get a small grant from the WORLDWISE Global School's (2020) programme and support the school to contribute to the KDYS Climate Justice and Just Transition Programme (2021) through the Seeding Sustainability project and the 1 KM health and well-being trail. This not only adds value to the project, it also helps raise awareness of the need to engage with Social and Environmental Justice, even though it is not privileged within the examined curriculum.

- **Agricultural Science Research Project**

In 2019, a new syllabus for the Agricultural Science Leaving Cert was introduced, including an Individual Investigative Study, a research micro-project, which makes up 25% of the full assessment. The project requires students to choose a specific agricultural enterprise focusing on the theme of sustainability. Students have to design an experiment to test a hypothesis of their choosing and report on their findings, beginning their project in May of 5th year and submitting for assessment in April of 6th year. This requires developing a research question, including experiments, the methods used to develop and test a specific hypothesis, draw conclusions and write it up in not more than 2,500 words.

These are skills that are not necessarily scaffolded in the Junior Cycle and only sporadically in Transition Year, dependent on many variables: school culture, teachers, selected projects, and resources. Increasingly, projects within the Senior Cycle will grow in line with the transition from Junior Cert to the new Junior Cycle in 2014, which included classroom based assessments. The MC resources were constructed to include the full three phases of project development and management including research and development, in anticipation of this transition. As a new syllabus, teachers, and students have by all accounts struggled, even those teachers with a science background.

Early in 2020, we were invited into the 6th Year Agricultural Science research project, running a session on zone mapping (part of the permCultural resilience praxis [3]) in order to examine potential areas of research. We have also developed supporting skills resources including report writing, leadership and enterprise, which we will be promoting and expanding these within our next phase - 2021 / 22 and beyond (funding pending) - 9.0 Next stages.

[3] www.codesres.ie/what-we-do



...ONE OF THE BENEFITS I FOUND DURING THE WEEK WAS I LEARNED HOW TO IDENTIFY AND UNDERSTAND PROBLEMS THAT AFFECT ME IN MY DAY TO DAY LIFE. THANK YOU SO MUCH FOR ORGANISING CERTIFICATES AND FOR SUCH AN INCREDIBLE WEEK!

EXTRACT FROM STUDENT - PROBLEM TO PITCH WEEK-LONG INTENSIVE



- **Work experience**

Our 'Problem to Pitch' module was initially presented as a series of trialed activities and then as a 5-day intensive design challenge within the context of work experience and working with an interdisciplinary research team. The process leads students through the full Design Thinking process: considering the problem; developing solutions and creating prototypes. The module culminates in a Dragon's Den style pitch using a LEAN Canvas [4] to construct a PechaKucha[5] presentation organized through their completion of a lean canvas on their solution proposal. It was a natural development from this module to consider in-service learning as a stepping stone towards the ambitions to include apprenticeships in the revised Senior Cycle.

- **GAISCE - In-Service Learning pilot**

As part of this process, we trialled an in-service learning model within the GAISCE programme. The GAISCE programme is the President's self-development award programme for young people between the ages of 15-25. There are three levels, Gold, Silver and Bronze, with Bronze usually completed as part of TY, with 4 key challenge areas:

- Community Involvement,
- Personal Skill,
- Physical Recreation and
- Adventure Journey.

In 2019 / 20 we used the opportunity to develop a website design activity for a local organisation, an asset that is invaluable to organisations, yet may still be beyond their capacity due to time and skill. We developed a step-by-step task-orientated learning process for the student, who came to our office once a week for an hour for 13 weeks. This also included meetings with the organisation and culminated in the completion of the website as the student's community involvement activity.

The module and the in-service learning process is now evolving into *Passion to Purpose*, a forty-hour core module for challenge-led, solution-focused learning. We will be aligning this to the Entrecomp framework <https://ec.europa.eu/jrc/en/entrecomp> a key competence framework, for entrepreneurial learning. The framework supports an understanding of entrepreneurship as a lifelong competence, identifying the elements that make someone entrepreneurial, whether applied within social, environmental or economic enterprises – see *next stages*.

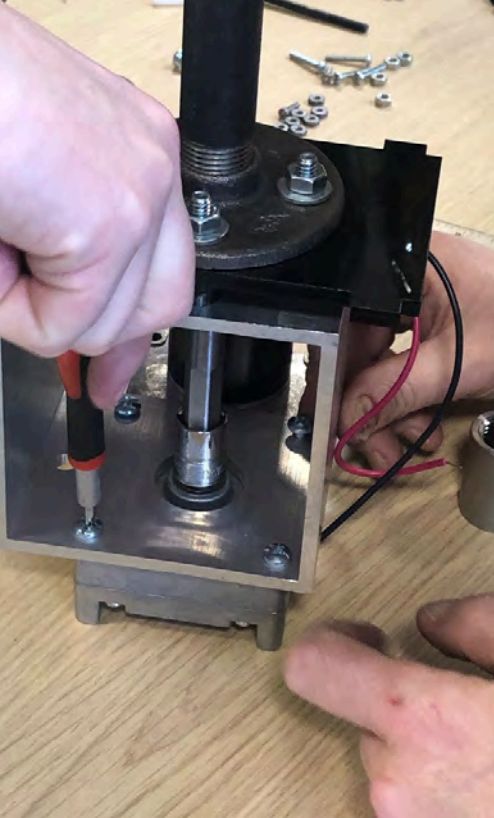
[4] LEAN canvas is a 1-page business plan template adapted from Alex Osterwalder's *Business Model Canvas* by Ash Maurya to help deconstruct your idea into its key assumptions

[5] PechaKucha is a storytelling format where a presenter shows 20 slides for 20 seconds of commentary each (6 minutes and 40 seconds total).



EDUCATION TODAY IS MUCH MORE ABOUT WAYS OF THINKING WHICH INVOLVE CREATIVE AND CRITICAL APPROACHES TO PROBLEM-SOLVING AND DECISION-MAKING. IT IS ALSO ABOUT WAYS OF WORKING, INCLUDING COMMUNICATION AND COLLABORATION, AS WELL AS THE TOOLS THEY REQUIRE, SUCH AS THE CAPACITY TO RECOGNISE AND EXPLOIT THE POTENTIAL OF NEW TECHNOLOGIES, OR INDEED, TO AVERT THEIR RISKS.

ANDREAS SCHLEICHER,
FROM THE OECD, 2018



6.7 Teacher support & CPD

The aim of Muinín Catalyst, unlike CoDesRes, was to offer interested teachers an induction followed by team-teaching and continued support to deliver the resources alone, rather than the team delivering the content. This was a way to trial the development of in-class Continuing Professional Development (CPD). This was in response to findings from CoDesRes: teachers felt CPD often involves considerable effort to attend and does not recognise their existing skills. By offering CPD, that is responsive to teachers' demands and feedback and through the delivery of in-class activities, we maintain removing these obstacles, we feel we can encourage teachers to develop the confidence and competence to deliver 21st Century skills. We have trialled this approach through Muinín Catalyst both through in-person and online activities:

- Completed Sept-Dec 2019: Recruited core teachers, delivering and team teaching across Science Dept (Chemistry / Agricultural Science) Geography, Irish, English and CSPHE / SPHE, Maths and Home Economics - 205 students.
- Sept 2020 - May 2021: We worked consistently with two teachers at Coláiste na Sceilge over the period Sept 2020 - May 2021. With one teacher, we worked on the design phase of the 1km trail, using Design Thinking. We engaged with other teachers throughout the year, working on smaller projects and one-off support visits to classes.
- Scheduled our first CPD online delivery session with Education Centre Tralee (10th May, rescheduled 15th Sept.)

We are keen to explore this further with more teachers across diverse subjects and to support the transition from teaching to facilitation.

7.0 Dissemination

Since the beginning of the project, we have presented Muinín CATALYST for Education in a number of ways, shared the programme, and have begun to position our approach within the broader global landscape of progressive education. As a systemic approach, we work across, STEAM CPD, classroom content development, and delivery as well as peer-reviewed journals and conference presentations:

- Doha Teacher & Learning Conference (Qatar) - *STEM to STEAM: Design Thinking for Problem Finding in the 21st Century - How do we integrate design thinking and doing into second-level education in ways that are relevant for youth?*
- Ireland International Conference on Education, April, 2021 *Muinín Catalyst - developing a place-based STEAM Design Thinking curriculum for second-level education*
- Upcoming: 2021 International Transdisciplinary Conference (Switzerland) - *Embedding place-based STEAM into teaching and learning - devised as a practical online-delivery*
- Upcoming: Royal Geographical Society (United Kingdom) Sept 2021 - *A local lens on global issues: Muinín Catalyst project (Rebecca White)*



SO AWESOME THE
COMMUNITY AND THE
SCHOOL.

YOUR WORK IS VERY
EXCITING TO SEE. THE
NUMBER OF PEOPLE
WORKING TOGETHER IS
INSPIRING.

IICE KEYNOTE ON MUINÍN CATALYST
CONFERENCE PRESENTATION



- Peer Reviewed Journal publications in AMPs (Architecture, Media Politics Society) and the International Journal of Cross-Disciplinary Subjects in Education (IJCDSE),

AMPS - Muinín Catalyst- towards a place-based STEAM, Design-Thinking toolkit for second-level education

IJCDSE- Muinín Catalyst - exploring future ready teaching and learning. <https://infonomics-society.org/wp-content/uploads/Muinin-Catalyst-Exploring-Future-ready-Teaching-and-Learning.pdf>

8.0 Key findings

This section of the report outlines the key findings with a brief discussion of each point and presents a summary of the threats and opportunities that Munin Catalyst revealed. This contributes to the next stages, presented before the concluding remarks.

With no prescribed curriculum in Transition Year, there is strong potential to augment gaps in learning and skills-building. However, students and teachers with a high-status exam-focused perspective can struggle to see the benefit from an approach that will not 'tell the student what they need to know' which could be explored more concretely within TY. Depending on the foundational base of 21st-century skills developed in their previous three years of post-primary schooling, there may be limits to the efficacy of one academic year. The Muinín Catalyst programme is designed to help students develop skills in:

- Research
- Critical thinking and inquiry
- Design-thinking
- Problem-finding and solving
- Digital literacy in the 21st-Century education
- Socio-environmental, open-source philosophy

8.1 De-programming

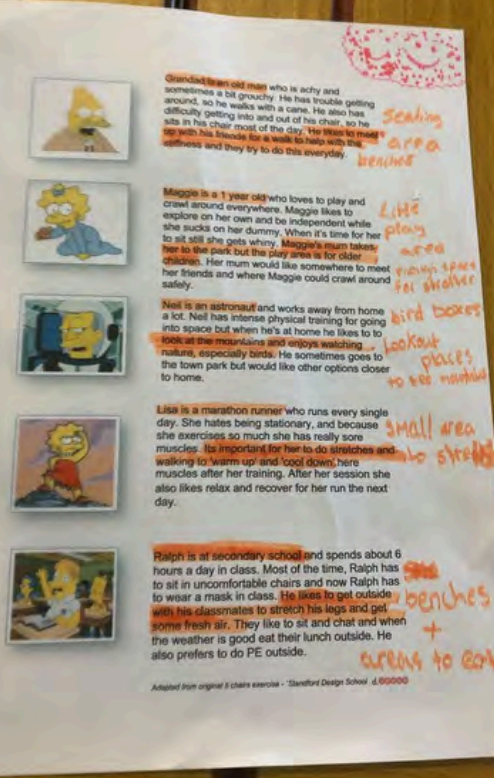
A reality, often overlooked, is the impact of teaching and learning that students (and teachers) have experienced in the three years prior to TY. Further, our prior research has shown that the limits to learning are being recognised as early as 7 - 8 years, by primary school learners. This has meant that the MC programme sees a new cohort each year, who have not had the experience of some basic aspects within the MC programme: no definitive answer or formulaic approach; iteration (trial, error or more commonly understood 'failure') is the way of learning; discussion and self-directed research, albeit scaffolded are not common.

This has meant two things, the first term is spent building confidence and challenging habitual learning habits and as with any behavioural change, such as de-programming can be uncomfortable. Our prior research



FEEDBACK FROM STUDENTS AND TEACHERS HAS BEEN VERY POSITIVE, SHOWING THE VALUE THE SCHOOL COMMUNITY PLACES IN THE PROJECT. IT HAS GIVEN US A MODEL FOR TRANSITION YEAR THAT I BELIEVE ALL SCHOOLS COULD BENEFIT FROM.

KERRY ETB



showed very quickly that we needed to factor this into safe approaches to learning in order to avoid overwhelm and consequent shut-down. While the ambition and desire may be towards new ways of learning, as outlined in the various reviews and teacher and student feedback: if it is to succeed it must be developed sensitively and constructively. To this end, our core project / R and D module and our other micro-modules were devised to ensure that students and teachers have a step-by-step 'distress tolerant' approach e.g. paired and group work, anonymous reporting, and feedback.

8.2 Project-based learning

Following on from the issue of scaffolding resources, a key finding came from supporting teachers working with existing off-the-peg project resources. Within TY, teachers do want to introduce new opportunities and take the opportunity to try new things. For many reasons, selecting one of the many off-the-peg projects available seems an obvious choice. However, many of these resources seem to have assumptions in-built, the most prevalent: teachers and students will have many of the skills that are necessary to undertake and execute such projects. As such, these skills, often implicit, are neglected within many of these resources.

Overt tasks such as form a team, create an effective awareness campaign are not only complex tasks, they often mask the need for more essential skills e.g. analyse the roles and skills required for the project's objectives, team discussion and communication, and working collaboratively. Off-the-peg resources do not develop or scaffold the skills needed to enable the teachers to adequately deliver them.

There is also limited confidence or technical understanding of the processes or time required to develop the skills through more iterative, exploratory approaches. Project development and management can only be partially learned through academic processes, experiential learning is necessary, and generally, students' and teachers' experience in this area is limited. Many teachers have not worked in other sectors, nor does teacher training support project-based learning, and the curriculum has only recently encouraged this style of learning in students. It is therefore difficult to subsidise the resources with prior experience.

It was also found that there can be a lack of interdisciplinary planning evident in some schools. Collaborative or team teaching across multiple subjects (linked learning) is not common or supported due to timetabling or other obligations e.g. teaching load or school culture. Linked learning could alleviate some of the time, effort and skills required to undertake project-based learning, especially using inquiry or experimental approaches.

Thematic approaches across subjects would encourage a systemic approach to acquiring knowledge and an interdisciplinary application. While this could subsidise the issues found within off-the-peg resources, it is only one of a number of issues that could inhibit developing 21st-century skills-appropriate resources.



IT HAS ADDED SOMETHING DIFFERENT TO MY STUDENTS' CURRENT DAILY TIMETABLE AND ALLOWS THEM TO BE CREATIVE AND IMAGINATIVE. THE APPROACH HAS BEEN VERY WELL ACCEPTED BY THE STUDENTS AND I HOPE TO WORK ON MANY MORE PROJECTS WITH THE TEAM GOING FORWARD.

EXTRACT FROM TY GEOGRAPHY TEACHER, COLÁISTE NA SCEILGE



8.3 Timetables and Covid-19

Due to COVID-19 lockdowns and restrictions, there was an immense reduction in face-to-face time with teachers and learners. This hampered progress in the practical components of delivering the modules and working alongside teachers to facilitate logistics and real-time CPD. Despite strong interest at the beginning of term from teachers, there wasn't strong uptake in developing and working with new material; perhaps constraints with delivering curriculum in restricted circumstances being the cause.

The ever-changing TY timetable caused issues with continuity in delivering the modules. Students and class groups could be pulled out of lessons for external trips or workshops, or team-building days (particularly over the COVID period). This has been our consistent experience with other schools also, and having a linked learning approach could alleviate some of the impact of this, with consistency across the week allowing students time to work on their projects as well as enhance student project success.

8.4 Building Capacity

One of the key findings of MC was the importance of building capacity in both skills and competencies for present and future scenarios. Our Future of Work event was designed to expand students' and parents' thinking on current and future developments in the world of work. Through the FOW event, we aimed to showcase different pathways and possibilities, locally and beyond. Through an exhibition of local entrepreneurs and local speakers in a range of professions, we hoped to highlight potential: previously unrecognised local opportunities for developing experience and supporting entrepreneurial activities.

In a rapidly changing world, there are new business opportunities, services and products. The demands for changing skills and competencies, not only in the world of work, can present both threats as well as opportunities, something the Muinín Catalyst programme seeks to bridge. By offering ways to augment the curriculum and present existing local opportunities can ease the transition and expand thinking around what is possible. This also increases the opportunities for developing employment of local faculty, supporting local economic resilience as well as challenging the dominant narrative of 'there's nothing here, we have to leave'.

Current research's (McKeown et al, 2021, McKeown and White, 2021; OECD, 2020, NCCA, 2020) preliminary findings show the need to provide learners with knowledge, skills and attitudes to deal with the challenges of the 21st century (OECD,2020).

8.5 What learners enjoyed

We continued to use the 3-2-1- class by class evaluation method:

- students were asked to report three things they felt they learnt within the class



IT'S GREAT TO SEE THAT OTHER SCHOOLS CAN SEE HOW GREAT ALL YOUR RESOURCES ARE

SCIENCE TEACHER,
TEACHING AND LEARNING
DEPARTMENT



I WOULD LIKE TO SAY HOW MUCH WE ENJOYED YOUR PRESENTATION; IT WAS HIGHLY INFORMATIVE AND ADDRESSED OUR NEEDS AND MORE. I FELT THAT IT WAS VERY COMPREHENSIVE AND OUTWARD LOOKING. I HOPE THAT IN THE NEAR FUTURE, I WOULD BE ABLE TO ASK YOUR ADVICE CONTINUING ON FROM THE DISCUSSIONS, AS WE WILL INEVITABLY NEED IT.

GREEN PARTY NATURE AND BIODIVERSITY EDUCATION POLICY WORKING GROUP

- two things they enjoyed, found particularly interesting or would like to know more about and
- 1 thing on their overall feeling about the class, did they like it or not.

The findings from the Muinín Catalyst programme were consistent with the findings in our prior research trialling and iterating the resources. Students clearly showing interest and needs for citizenship and political education, sustainability and climate change education, and opportunities for interdisciplinary learning and applying their knowledge. Group work, practical and interactive activities and the importance of the skills embedded in the lessons were noted.

8.6 Digital literacy

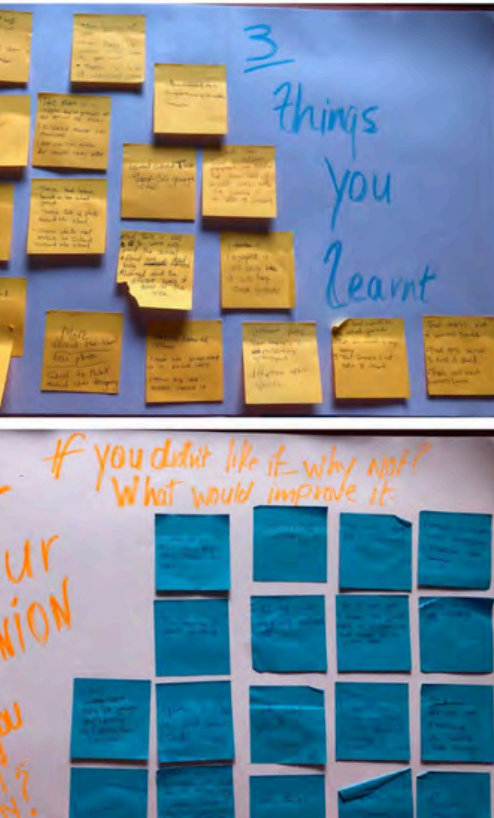
Our resources use blended learning which highlighted a number of challenges; students were not used to self-directed learning even when scaffolded (building up learning supports) or using digital tools. This is potentially a blind spot within education, as students are using mobile technology for socialising or entertainment, but their skills with technology for learning should not be assumed despite their competence with gaming, apps or social media.

There have been improvements in the academic year 2020/21 with more training and scaffolding in the use of Microsoft Teams, inevitably COVID-19 schools closure forced this issue. This further identified the need for structured blended learning that integrates analogue pedagogical principles with available technology as an area for development within teacher training. To this end, we have begun developing a Digital Literacy for Learning micro-module, which will become part of the resources.

8.7 Environmental Education

There have been developments in introducing Education for Sustainable Development into primary and post-primary education. In primary-level education, this is easier due to the whole-class approach, rather than the siloed subject areas of post-primary level, where different teachers teaching different subjects (Nevin, 2008, 54) and a focus on high-status examinations. MC emerged from research that integrated the SDGs into educational resources. In order to ground the SDGs into a more generative ethos, we plan to develop resources that fold in the pillars of the Earth Charter; in order to ground the work in a values-based approach - <https://earthcharter.org>

Our CoDesRes research found that students were experiencing eco-anxiety - they were worried about their future - 'because they didn't think they had one' (CodesRes, 2021). They also reported, not talking to friends or adults and that our resources gave them hope. In having accurate information and seeing opportunities to effect change, the students felt more able to process the situation and less helpless.



9.0 Next stages

Since early 2021 we have been considering the projects next stages, particularly ways to continue our work, including a strategic development programme. We have been considering our strengths and weaknesses,



and includes the following activities:

- Re-scheduling programmes in the new academic year.
- In conjunction with school and other funded work, create and deliver a 'Future of Work' event for parents highlighting changes in skills needed.
- Where appropriate, scale-up / down for other years e.g. Junior / Senior Cycle.
- Future Pathways and Beyond
- Teacher support & CPD

9.1 Re-scheduling programmes in the new academic year.

Due to COVID-19 restrictions, a number of key activities were postponed: the Future of Work event and the Internet of Things (IoT) workshop. We are planning to reschedule both events for the upcoming academic year.

Future of work: This event is important for parents, students and educators. Industry and recent research recognises the changes necessary for the future of work. The changes across professions in the last 5 -10 years has been immense, with the rate of change set to increase exponentially. Awareness of what is already happening in technology, work, and research needs to be developed. While we cannot predict what careers and therefore skills will be needed we can equip learners to be agile.

Internet of Things (IoT): We will facilitate the design, build and the deployment of an Internet of Things dashboard in the new academic year. We have maintained discussions throughout the last year with Stephen Howell, co-lead on the IoT project, and now also support from Kerry ETB / Jeremy Wrenn, Learning Technology Officer to hold the data on the ETB servers, providing both security compliance and an in-kind cost.



THE CORE PROPOSITION IS THAT PARTICIPATION IN CULTURAL ACTIVITY DRIVES PERSONAL AND COLLECTIVE CREATIVITY, WITH SIGNIFICANT IMPLICATIONS FOR INDIVIDUAL AND SOCIETAL WELL BEING AND ACHIEVEMENT.

CREATIVE IRELAND 2018



WONDERFUL WORK
AND HONOURED TO BE
CONTACTED TO WORK
WITH THESE TALENTED
AND VISIONARY
INDIVIDUALS.

BIANCA PEEL,
EDUCATION CONSULTANT,
HUNDRED ADVISOR

9.2 Scale-up / down for other years

We have scaled some of our resources to other years and activities on a few occasions e.g. Science week Scavenger hunt, Aonad third-year group, Ag.Science 6th years with potential to develop a programme within the Junior Cycle Philosophy programme as an alternative to the Religion exam.

- **Junior / Senior Cycle:** Increasingly project and inquiry-based learning is being integrated into the Junior and Senior cycles. In our findings we maintain that to really benefit this approach and reflect the students' efforts and achievements, two inter-related things must happen.

1. Teachers need to be supported to utilise the myriad of existing resources available particularly with links to Open Source / Open Innovation practices, start-up methodologies and tools, as well as a focus on teacher training for place-based STEAM and project-based learning.

2. Increase in weighting on assessments to adequately reflect students' efforts and achievements in their grades.

These two factors are mutually supportive - with specific training for teachers to deliver place-based STEAM project-based learning (PBL), the risk of increasing the final assessment percentage is reduced. Without this support, it would be unfair to increase the weighting for PBL as students would not be supported to reach their potential. This will require rethinking the training of Ireland's - section 9.5.

- **Leaving Certificate Vocational (LCVP) and Leaving Certificate Applied (LCA)**

The MC programme could also support the Leaving Certificate Vocational Programme (LCVP) and the Leaving Cert Applied (LCA) The LCVP has a strong vocational aspect integrating Leaving Certificate Exam (LCE) subjects, together with three compulsory link modules on enterprise education, work and work experience. The current LCA allows students of different learning styles/strengths to achieve and receive recognition for their learning. The continuous assessment and modular aspects of the LCA offer a more flexible structure than that of the LCE.

The NCCA review (2019) found that a mixture of academic and vocational courses/apprenticeships should be available to all students offering opportunities beyond the current overall focus on the third level. A deeper modular approach could offer vocational and apprenticeship alternatives to third-level academic study, which is not meeting the needs of all students. COVID-19 and the changes to the LCE have meant more potential opportunities for the MC programme to contribute to developing a 'curriculum for all'.

9.3 Future pathways and beyond

The relationship with Kerry ETB is part of the strategy to roll out the Muinín Catalyst programme to the post-primary schools (8) under their remit This is



IT IS COMMONLY UNDERSTOOD 65% OF STUDENTS WOULD BE EMPLOYED IN JOBS THAT DON'T YET EXIST. HOWEVER, WITH THE ADVENT OF UBIQUITOUS TECHNOLOGY, IN REALITY, 100% OF JOBS ARE NO LONGER UNDERTAKEN IN THE SAME WAY. THINK OF THE CHANGES IN YOUR OWN JOB OVER THE LAST FIVE - TEN YEARS.

MUINÍN CATALYST

part of a larger, funding dependent development strategy – a regional beta programme designed to test and develop the resources with 16 schools. We are proposing a hybrid model with teacher and student inductions, followed by online support while using the developed resources, as well as intensive weeks, face-to-face in the schools, as well as in-service projects with follow-up, online support.

We have tested many of these activities through CoDesRes and Muinín Catalyst, providing a solid evidence-based approach to the beta programme, which will enable us to test the resources with a larger, more diverse cohort. This will also provide an opportunity to consider the findings within the context of the National Council of Curriculum Assessment (NCCA) review and the Organisation for Economic Co-operation and Development (OECD) review.

9.4 Teacher support & CPD

As part of the beta programme, we aim to form a core group of Transition Year teachers to work with the programme over the academic year (Sept 2021 – May 2022 / 23). This forms part of our strategy to contribute to delivering 21st Century CPD both through the Education Centre Tralee, a regional roll-out, and Professional Development Service for Teachers.

9.5 Strategic Development

We are also planning to continue the work through the development of a new organisation, a social enterprise that will deliver the MC programme of work with other related educational aspects. This will provide the structure to enable the MC programme to continue to grow and expand. To this end we have undertaken strategic development with a consultant and developed a number of opportunities and collaborations – Section 10

9.6 Next Stage Funding

As well as having developed the beta programme, we have developed a number of modular interlinked projects that can be supported through a number of funding schemes to continue to develop the MC programme.

SFI - €299K submission: We have updated and re-submitted a proposal for funding under SFI's 2021 Discover Programme. Our submission, 'Muinín Catalyst Sustainable STEAM; Future-ready teaching and learning for resilience' proposes to work with 16 schools to beta test an agile response to augmenting and transitioning the Irish senior cycle with 21st Century future-ready skills-based towards a curriculum for all.

Rethink Ireland - Engage and Educate €150K: The Muinín CATALYST – INCLUDE youth innovation cafe programme – series of ICT learning cafes and intensives to develop the contemporary skills and competencies that can be difficult to access for the target age group in a rural community.

Clar Innovation - €50K: The Clar Innovation fund submission if successful will also support the Muinín CATALYST – INCLUDE youth innovation cafe programme.



10.0 Current & Future Collaborations

From inception, Muinín Catalyst sought to undertake a systemic approach to its educational interventions, so although focused on developing resources, the team sought to embed their work within the broader education system and developed related connections.

- **The Ballroom:** As part of the broader education ecosystem, the development of a Research and Development centre of excellence in place-based STEAM and placemaking is the long-term goal which will include research and training across all levels of the system: early years to 3rd level.

Tate-St Ives: Connected with their Palais de Danse project part of the Barbara Hepworth Studio complex and set to become an arts-led digital hub. We are keen to develop this relationship as a sister project for exchanges between young people in Cornwall and young people in Kerry and Ireland.

Arts-Mind Lab, John Hopkins University, USA: links with the Arts-Mind lab will be developed through connections with MC's Dr. McKeown, who has been invited to participate in their work, focusing on well-being and placemaking.

- **All-Ireland Climate Change and Biodiversity Research Network:** The All-Island Climate and Biodiversity Research Network is a researcher-led initiative that began in 2020 to work together across the island of Ireland. The aim is to undertake the research necessary to address the climate and biodiversity emergencies, which require sustained collaborative and multidisciplinary research. MC's Dr. Anita McKeown is a member and will use this opportunity to push for researchers to engage more with developments within post-primary activities and work within the psycho-social aspects for a Just Transition. The MC programme is well placed to build on this collaboration and sought funding within the SFI submission for this purpose.
- **Creative Learning Network/Peer Network:** We aim to develop a Creative Learning Network in Ireland, based on a peer-to-peer model of information sharing, collaboration, and research around creative solutions to teaching and learning. We have formed relationships with Clare Hoare (Creative Learning Officer, Stirling County Council, Scotland) and hope to form a partnership with the Creative Learning Network (Scotland / Wales) going forward. Our vision over the next 2-3 years is to facilitate the development of a Creative Learning Network throughout Europe.
- **Learn Life:** Over the past 6 months, we have been in informal discussions with the team at Learn Life about establishing a learning hub. Learn Life is based in Barcelona and is building an open ecosystem for a new lifelong learning paradigm alongside existing education systems. <https://learnlife.com/>



THE CORE METHODOLOGY UNDERPINNING OUR RESOURCES WAS SELECTED BY THE ROYAL IRISH ACADEMY'S COMMITTEE ON CLIMATE AND ENVIRONMENTAL SCIENCES AS A CASE STUDY FOR CO-DESIGN AND SUSTAINABILITY.

MUINÍN CATALYST



11.0 Conclusion:

Research shows we need to develop education that engages with geopolitical concerns, the climate emergency, and other emergencies (CoDesRes, 2021; OECD, 2020; Together for Design, 2020; NCCA, 2019). Muinín Catalyst Sustainable STEAM (MCSS) programme is a transdisciplinary pedagogical approach that utilises the Sustainable Development Goals as a thematic principle for the creation of place-based STEAM lesson plans and blended learning resources that augment the Irish Curriculum with 21st Century future-ready skills; Creativity, collaboration, critical thinking, creative problem-solving, design thinking and the ability to communicate and develop effective real-world solutions to key global challenges.

The external report from OECD to Ireland is also very timely in the context of seeking changes to our education systems enabling our young people to have the necessary skills for the challenges that are before them, our societies, and economies of the future. We are the only evidenced-based resources that integrate place-based STEAM, aligned with the Sustainable Development Goals, through a project-based learning model that is challenge-led and solution-focused. Further, our resources have been built to scaffold both teaching and learning, supporting educators to integrate this pedagogical approach to their practices, through in-class continuing professional development.

We look forward to continuing to progress this work and develop the next stages as outlined earlier in the report.



FEEDBACK FROM STUDENTS AND TEACHERS HAS BEEN VERY POSITIVE, SHOWING THE VALUE THE SCHOOL COMMUNITY PLACES IN THE PROJECT.

IT HAS GIVEN US A MODEL FOR TRANSITION YEAR THAT I BELIEVE ALL SCHOOLS COULD BENEFIT FROM.

Kerry ETB





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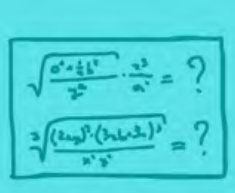
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United Nations 2030 Agenda <https://sdgs.un.org/2030agenda>



EDUCATION IS THE MOST POWERFUL WEAPON WHICH YOU CAN USE TO CHANGE THE WORLD.

Nelson Mandela



Muinín Catalyst
was supported by



The 2030 Agenda for Sustainable Development envisages "a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination."

United Nations



We look forward to continuing with our vision and thank you to all who supported us over the last two years.

