



# RDS STEM Learning

## Challenging Science Facilitation

Karen Sheeran<sup>1</sup>, Sandra Austin<sup>2</sup>, Odilla Finlayson<sup>2</sup>, Maeve Liston<sup>3</sup>, Tom McCloughlin<sup>2</sup>, Cliona Murphy<sup>2</sup>, Greg Smith<sup>2</sup>

<sup>1</sup>RDS, Dublin; <sup>2</sup>CASTeL, DCU, Dublin; <sup>3</sup>Mary Immaculate College, Limerick

# RDS STEM Learning



# CURIOSITY









# HOW?

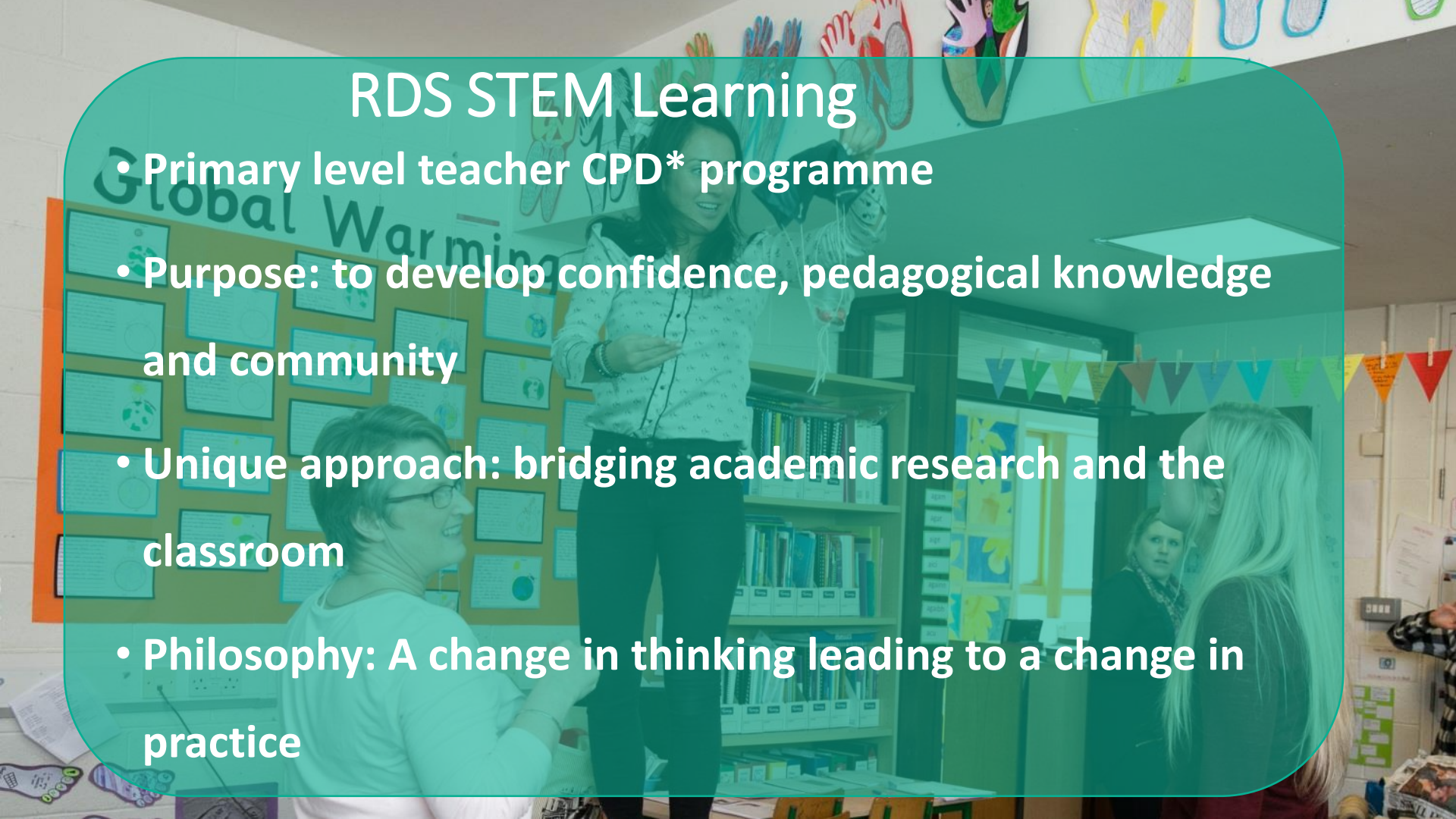






# RDS STEM Learning

- Primary level teacher CPD\* programme
- Purpose: to develop confidence, pedagogical knowledge and community
- Unique approach: bridging academic research and the classroom
- Philosophy: A change in thinking leading to a change in practice



The logo for RDS STEM Learning is located in the top left corner. It features a large white pentagon with a blue and yellow border. Inside the pentagon, the text "RDS STEM Learning" is written in a bold, teal, sans-serif font. To the right of the pentagon are three smaller, overlapping hexagons in yellow, blue, and white.

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# THE NEED



...primary school teachers in Ireland demonstrate

*‘below average levels of participation in continuous professional development, particularly where related to maths or science’ and ‘average confidence levels for maths and below average confidence for science’.*

(Eivers and Clerkin, 2013)



	ACTION	DESCRIPTION	LEAD RESPONSIBILITY	TIMELINE
<b>3.2</b>	<b>Further scale initiatives to encourage young people and the wider population to participate in STEM disciplines and engage the broader Irish public in STEM</b>	<ul style="list-style-type: none"><li>a. Increase support for the Smart Futures and SFI Discover programmes and build on success of initiatives including Student Enterprise Awards, CoderDojo, Science Week Ireland, BT Young Scientist.</li><li>b. Increase Irish public awareness of STEM from 49% to 60% of the population (350,000 additional people)</li><li>c. Increase the level of uptake of STEM at second level</li></ul>	<p>SFI, DES, HEA, with other funders, stakeholders and co-sponsors</p> <p>SFI, DES, HEA</p> <p>SFI</p>	<p>2016 - 2020</p> <p>2020</p> <p>2020</p>



Dublin 25<sup>th</sup> June 1731

Present.

Judge Ward

D<sup>r</sup> Stephens



**A philanthropic Society  
supporting Irish society by acting as a  
catalyst to ensure that the coming  
generations can fulfil their potential**

in Trin: Col: Dub: in order to promote  
Kinds. & D<sup>r</sup> Stephens being desired took the Chair.

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# WHAT?



*...an 'innovative and interactive professional development programme aimed at developing participants' pedagogical and conceptual knowledge of science' at the primary school level*



## GOALS

1. Develop teachers' pedagogical knowledge of teaching science through inquiry
2. Increase teachers' confidence in teaching science
3. To develop a reflective professional learning community

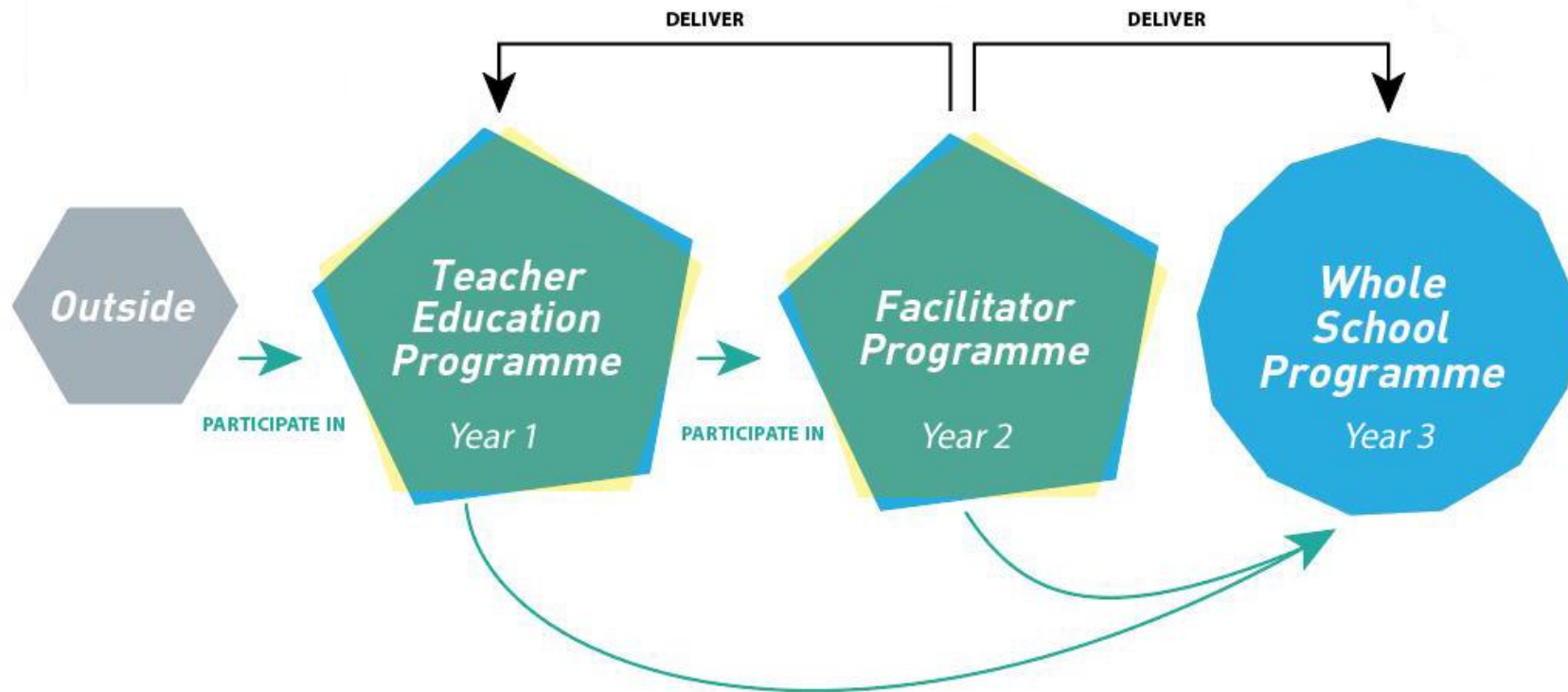




- Encouraging Creativity in Science
- Developing students' dialogical and thinking skills through Science
- Integrating Science and Mathematics in the Classroom
- Using Design and Technology in the Classroom
- Guiding Child-led Investigation
- Exploring Children's Ideas of Science



- Discover Primary Science and Maths/ESERO
- RDS STEM Learning Teacher Education Programme
- RDS STEM Learning Facilitator Programme
- RDS STEM Learning Whole School Programme
- RDS STEM Learning National Conference



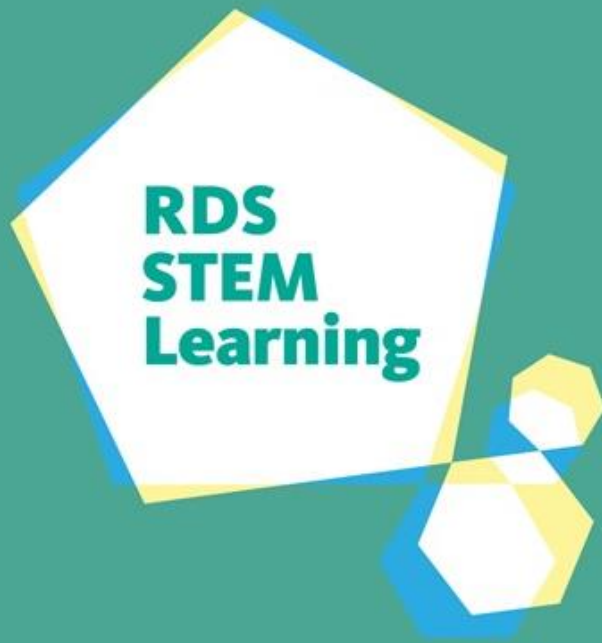


# RDS STEM Learning Facilitator Programme 2012/2013





- 10 x 3hr workshops, held at St. Patrick's College of Education, Drumcondra.
- 12 teachers, from 12 different schools across 5 counties (Cork, Wexford, Kildare, Meath, Dublin).
- Participants then went on to develop and deliver the Teacher Education programme in 2013/2014, and continued as Facilitators of the Whole School programme in 2015/2016



# RDS STEM Learning Teacher Education Programme 2013/2014



- 8 x 2.5 hr workshops, held at St. Patrick's College of Education, Drumcondra.
- 38 teachers, from 24 different schools across 8 counties.
- Many of these teachers have gone on to participate in the 2015/2016 RDS STEM Learning Facilitator programme.



# IMPACT





- 5 evaluation dimensions
  - Relevance
  - Effectiveness
  - Efficiency
  - Impact
  - Sustainability



- International literature review
- Data review
  - *surveys, participants' reflections on classroom practice, feedback on workshops, programme strategy papers, plans and reports*
- Qualitative interviews
- Analysis and recommendations

# Key Messages

The pilot STEM project has delivered significant measurable impact in the areas of teacher confidence and ability, and student engagement.

STEM CPD programmes of longer duration tend to have better outcomes for students and teachers; while not reaching the internationally recommended length, the pilot STEM project has demonstrated a positive departure from existing CPD offerings in Ireland.

# Key Messages

**There is no international consensus on benchmarking effective CPD; the pilot STEM project has the potential to demonstrate innovative practice in this area.**

**International benchmarking and literature review has shown that a balance between pedagogical improvement and the provision of subject specific knowledge is imperative in effective CPD programmes; the pilot STEM project has demonstrated effective practice in these areas.**



# Key Messages

The engagement of external academic experts in pedagogy and CPD, and the collaborative delivery model of the pilot STEM project has yielded positive outcomes.

Participants in the pilot STEM project began to shift from measuring success in teaching in terms of '*what a child knows*' to the way in which a child can think.



# Key Messages

**Teachers commented that they are now much more reflective of how lessons are going and how they can be improved.**

**An additional impact for students was also noted; that they observed that 'their teachers' education was continuous and not static'.**

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# TEACHERS





**“I see science as a really inspirational trigger  
for thinking”**



**“Given me the confidence to allow them to have more control over their learning”**





**“This has redefined my thinking about the nature of a science lesson”**





# COMMUNITY



**“Sharing ideas with equally enthusiastic teachers”**



A photograph of two women in an office setting. The woman on the left, with brown hair tied back, is wearing a dark blue cardigan over a grey top and has her hand to her face in a listening pose. The woman on the right, with shoulder-length brown hair, is wearing a black blazer and a silver chain necklace, smiling while holding a white folder. In the background, a grey door is visible with several papers pinned to it, including one with the word 'OCCUPY' and another with 'SCIENCE'.

**“The sessions motivated us to think about STEM and what it means in primary schools”**

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# CHILDREN



**“Children no longer perceive science as a  
passive process”**





“Huge enthusiasm, excitement and willingness to explore and work in groups”





**“The children develop scientific thinking and skills from the outset”**



**“Their language and ability to describe what they are doing has improved”**



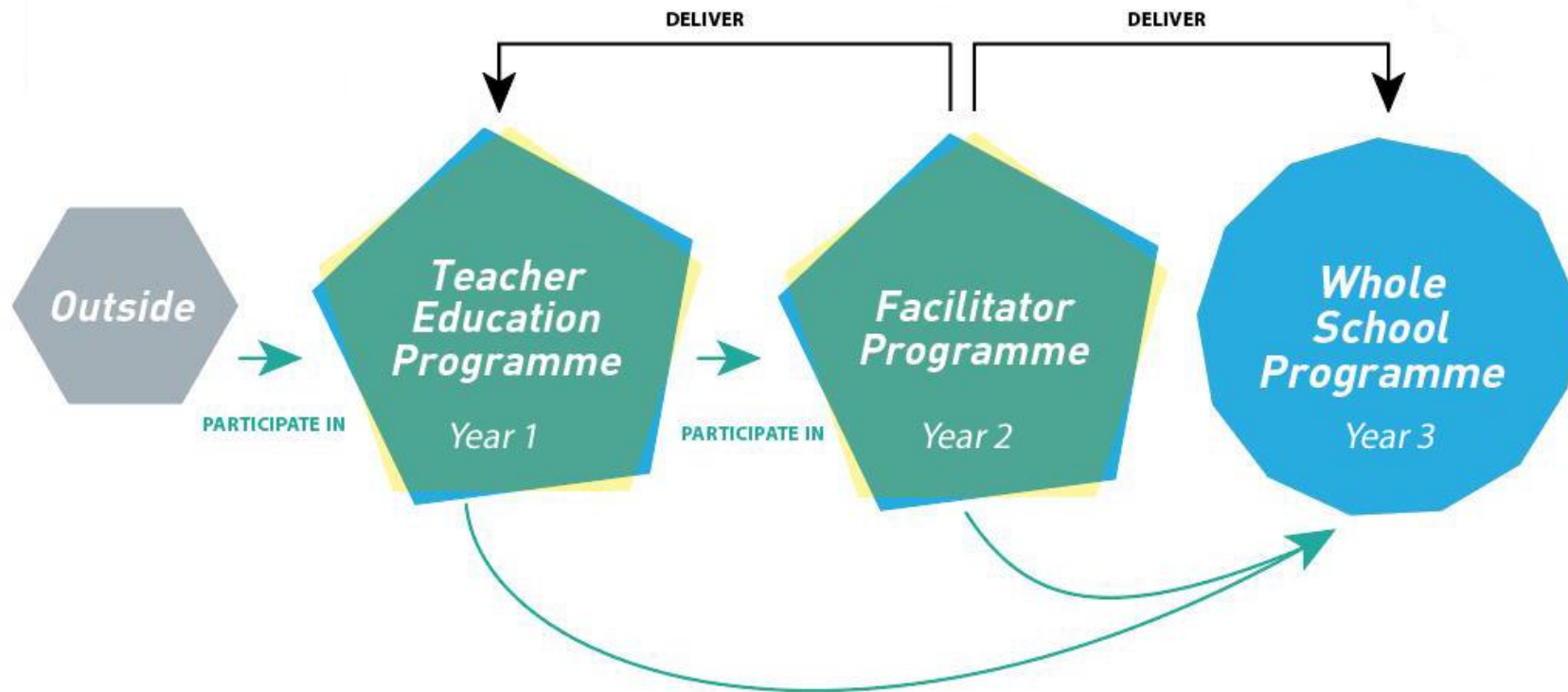


**“They are not afraid to make mistakes”**





# VISION





# Global Warming

A change in thinking leading to a  
change in practice





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