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Knowledge Exchange Seminar Series (KESS)

...is a forum that encourages debate on a wide range of research findings, with the overall aim of promoting evidence-based policy and law-making within Northern Ireland

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Professor Teresa Cremin

Dr. James Clack with Professor Anna Craft, OU

Seminar 23rd Jan 2014

EU FP7: 2011-2014

The ***Creative Little Scientists*** project set out to examine the potential for inquiry and creativity in learning and teaching in early years science and mathematics and to build on research findings to suggest implications for policy and practice in schools and teacher education.

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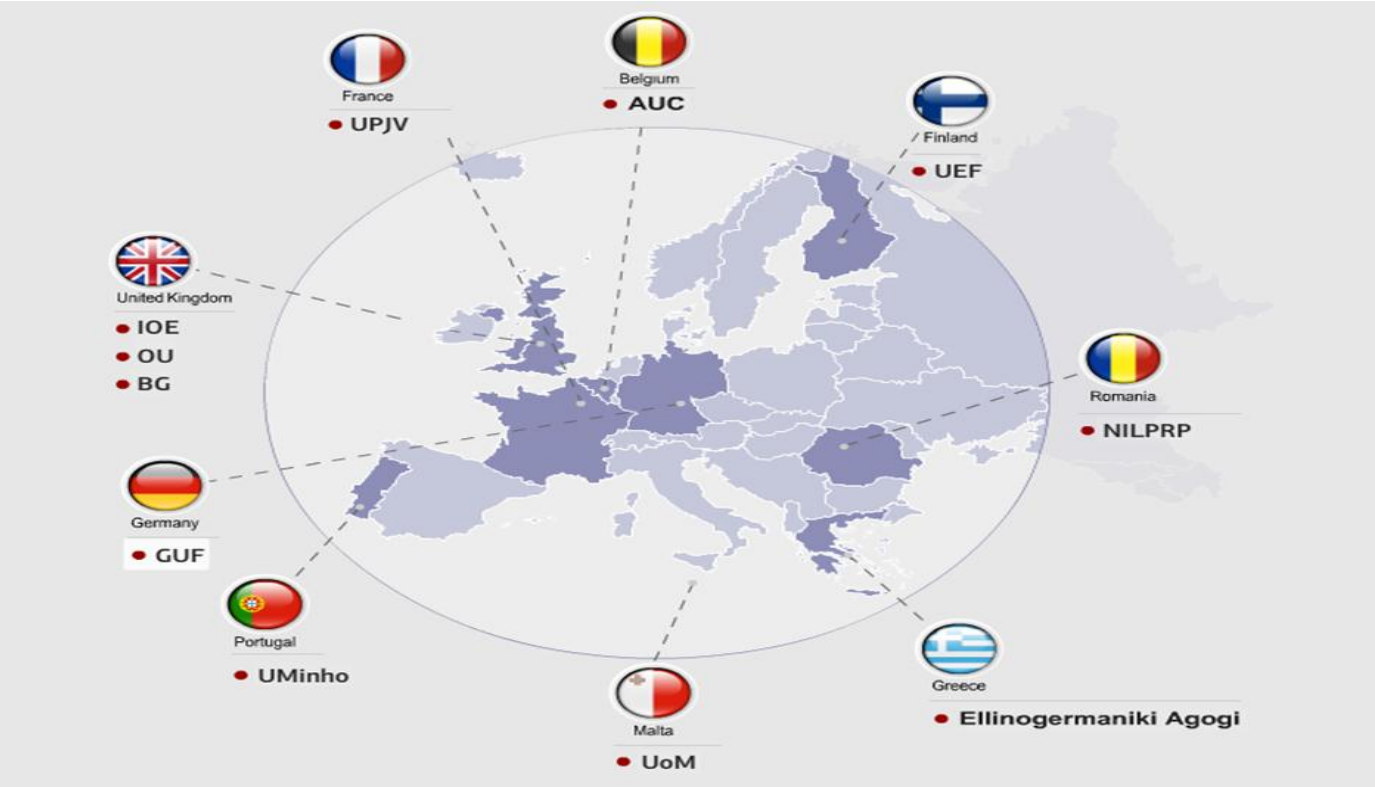

Project Partners

2011-2014

http://www.creative-little-scientists.eu

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Five key strands

Literature review of teaching science, mathematics and creativity and synergies

Desk study of policy in early science and mathematics (approaches recorded in policy)

Questionnaire survey of teachers' views and practices (approaches reported by teachers)

Fieldwork to examine practices in a variety of preschool and early primary settings across the UK (approaches implemented)

Recommendations for policy and practice, with particular reference to teacher education (both CPD and ITE)

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Project definitions of creativity

Little c creativity – *'Purposive imaginative activity, generating outcomes that are original and valuable in relation to the learner ' (something of which we are all capable)*

Creativity in science and mathematics *'Generate alternative ideas and strategies as an individual or community, and reason critically between these.'*

Dispositions characteristic of creativity in learning, include: a sense of initiative, motivation, imagination, curiosity, ability to work together and thinking skills.

References to creativity in policy

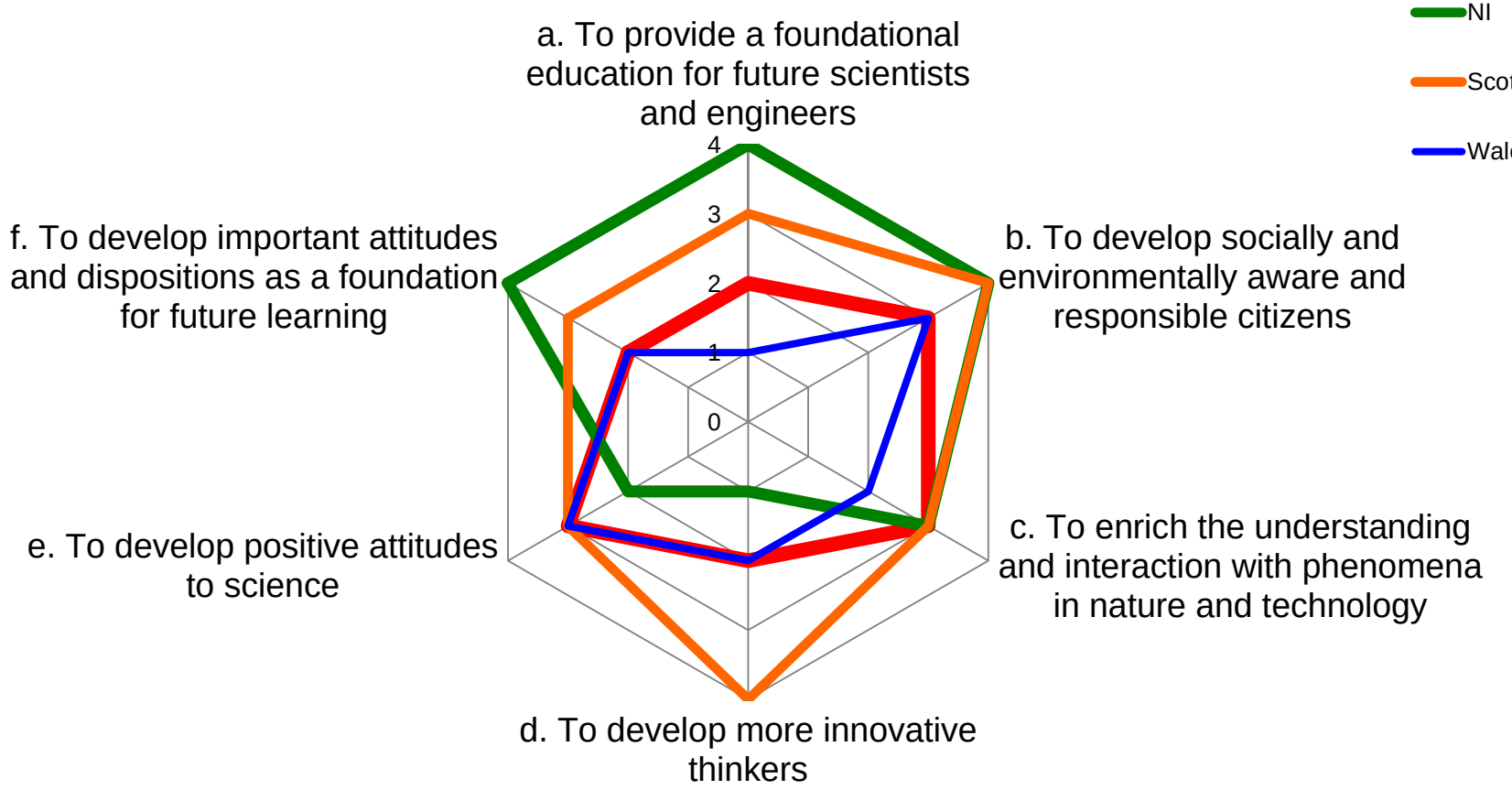
NI :Explicit about the role of creativity in education, framing it within a child-centred approach. 'Being Creative' is one of the Thinking Skills and Personal Capabilities (DENI, 2007).

Scotland: "Think creatively and independently", "create and develop" are part of the curriculum framing for "successful learners" and "effective contributors"(SE, 2004)

Wales: As part of developing positive attitudes and innovative thinkers in KS2 Science , "Activities should foster curiosity and creativity and be interesting, enjoyable, relevant and challenging for the learner" (DCELLS, 2008).

England: "Engender an appreciation of human creativity and achievement." (DfE, 2013). By implication learning about creative geniuses, rather than developing it themselves.

Rationale (Primary)



Implicit emphasis on creative dispositions, exploration and inquiry across the UK, though phase differences

In England connections to creativity can be seen in the emphasis on *problem solving*, *exploration* (Early Education, 2012) and *encouraging children to take risks and make connections* (DfES, 2007).

In Northern Ireland, the introduction to 'The World Around Us' makes reference to fostering children's *natural curiosity* and the need for opportunities for children to "*sort and classify, explore, predict, experiment, compare, plan, carry out and review their work".*

http://www.nicurriculum.org.uk/foundation_stage/areas_of_learning/the_world_around_us/

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Classroom-based fieldwork

Pedagogical interventions	Pedagogical framing
Learning activities (how children were learning)	Aims and objectives
Practitioners' approaches to pedagogy	Location
Practitioners' approaches to assessment	Grouping
Materials and resources involved	Time

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Learning activities

e.g. questioning, exploring, observing, making connections

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Practitioners' approaches to pedagogy

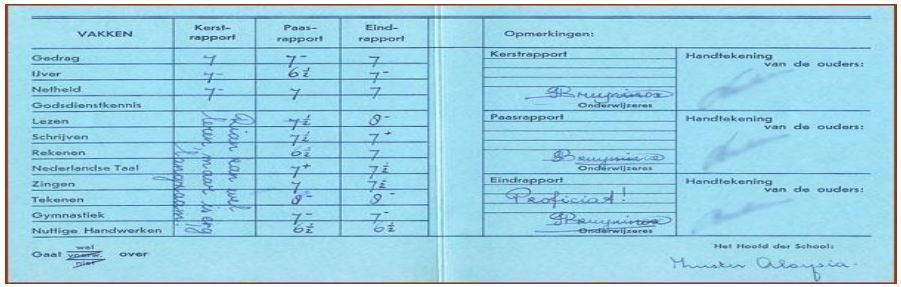
e.g. standing back, intervening, questioning,

Assessment

More difficult to evidence

Mostly formative, ongoing and integrated

Summative assessment rarely seen in early years science education



VAKKEN	Kerst-rapport	Paas-rapport	Eind-rapport
Gedrag	7	7-	7
IJver	7-	6+	7-
Netheid	7-	7	7
Godsdienstkennis			
Lezen		7+	8-
Schrijven		7+	7+
Rekenen		6+	7
Nederlandse Taal		7+	7+
Zingen		7	7+
Tekenen		8-	8-
Gymnastiek		7-	7-
Nuttige Handwerken		6+	6+

Opmerkingen:

Kerstrapport — Handtekening van de ouders:

Onderwijzeres

Paasrapport — Handtekening van de ouders:

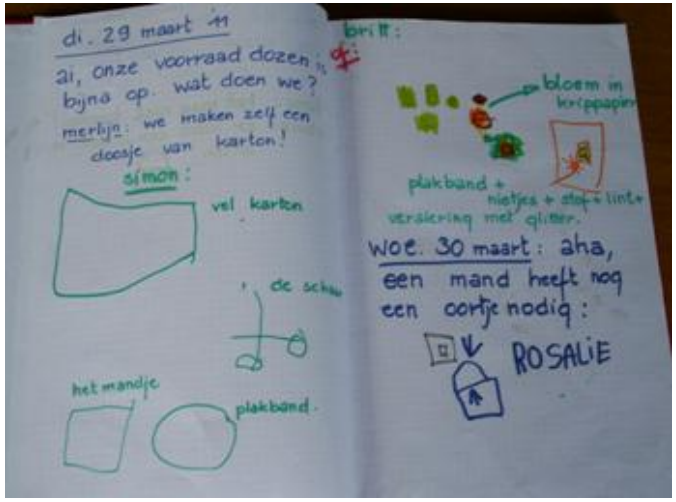
Onderwijzeres

Eindrapport: Proficiat! — Handtekening van de ouders:

Onderwijzeres

Het Hoofd der School:

Gaat wel / voorlopig niet over



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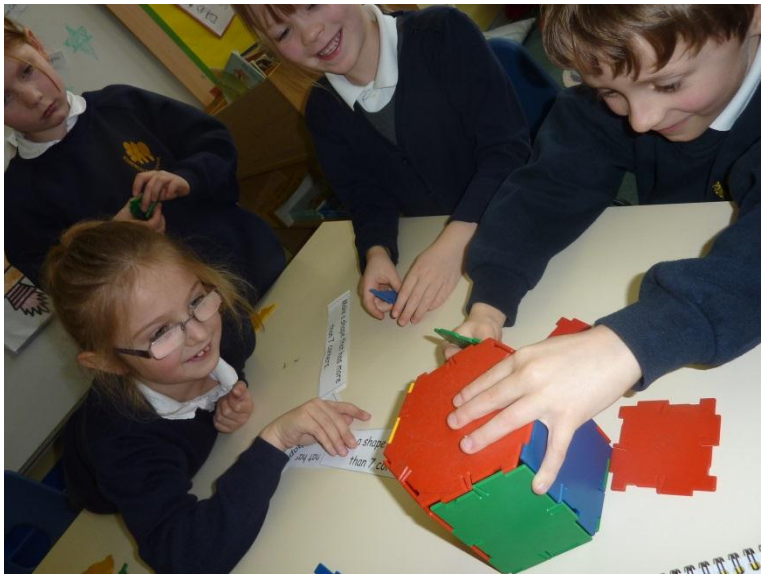
Materials and resources

e.g. use of storybooks for contexts,



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Classroom-based fieldwork

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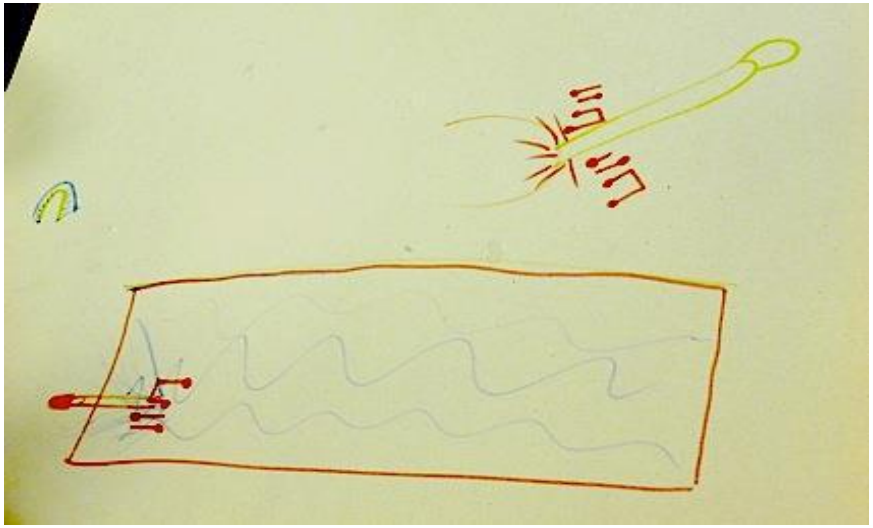
Aims and objectives

e.g. nature of science knowledge, mathematical knowledge,



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Location

e.g. use of outdoor school space, field trips, indoor role play areas,

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Grouping

e.g. small groups/pairs

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Differences between primary and preschool pedagogy

Preschool: staff more likely to stand back and allow children to follow their own inquiries based on curiosity, more facilitators than instructors.

Primary: pedagogy more likely to be shaped by the teacher, and questions used to check on children's subject specific knowledge as well as to prompt children's explorations and curiosity. Play was uncoded in nearly half the episodes observed.

Approaches to Teacher Education

- ***Professional conceptions*** *of inquiry, problem solving and creativity in mathematics and science need attention.*
- ***Whole school approaches*** *can support* creative teaching and learning and inquiry based approaches in mathematics and science.

Pedagogical Interactions

- Teacher scaffolding.
- Designing learning activities.
- Teacher questioning
- The use of ICT.
- Forms of representation and expression.
- Assessment for learning
- Classroom research as a tool to develop practice

Implications for policy development

The key policy implications relate to :

- CPD entitlement
- Training for science and mathematics co-ordinators
- Potential of projects and initiatives to raise the profile of science
- Policy coherence
- Curriculum space and time
- Valuing formative assessment

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Enabling Creativity through Science and Mathematics in Preschool and First Years of Primary Education

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