Teaching Numeracy as a cross curricular subject in post-primary school

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Outline of Presentation

- Rationale
- Aims of study
- Personal Motivation
- Literature review
- Frameworks for teaching Numeracy
- Future direction of my study
- Conclusion

Rationale

- *At present, internationally and in Ireland there is a conscious effort being made to improve and raise the profile of the teaching and learning of Numeracy (Goos et al 2010; DES, 2011,).*
- *In November 2010, the Minister for Education and skills in Ireland ascertained that Literacy and Numeracy are skills that every person should develop fully in order to meet the demands of everyday life.*

Aim of study

- The primary aim of this study is to investigate post-primary school teacher's understanding of the term Numeracy and the importance of teaching Numeracy in their own specific subject.

Personal Motivation

- When the Literacy and Numeracy strategy was introduced in 2011, I was teaching as a post-primary mathematics teacher. I was appointed as the Numeracy link teacher for my school.
- The Numeracy link teacher is responsible for promoting and enhancing the teaching and learning of Numeracy in the school.

Definitions of Numeracy

"Is an individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena. It assists individuals to recognise the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens" (PISA 2012, p.4).

"Numeracy is generally seen as some combination of mathematical knowledge, tools and dispositions and to be numerate means to be willing and able to use this knowledge , tools and dispositions across a wide variety of contextual (even real) situations." (Liljedahl, 2015 p.1)

"Numeracy is the capacity to make effective use of mathematics in contexts related to personal life, the workplace, and in exercising civil responsibilities" (Geiger et al, 2014)

Teacher Knowledge of Numeracy

"No one questions the idea that what a teacher knows is one of the most important influences on what is done in classrooms and ultimately on what students learn"

(Fennema and Franke (1992), p147).

Numeracy internationally

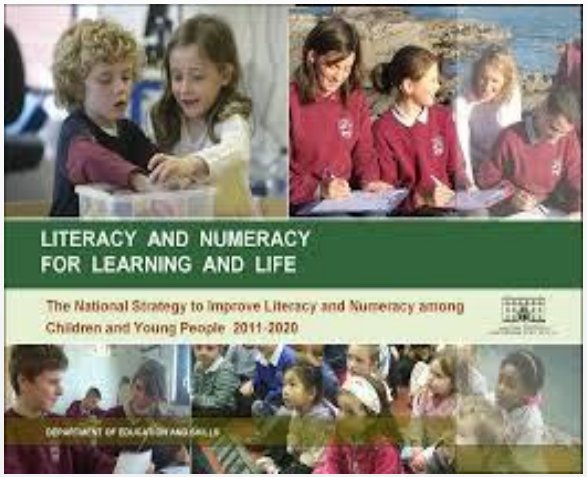
- Internationally and in Ireland, there is a significant focus on teaching Numeracy as a cross curricular subject (DES (2011); Liljehdal (2015); Geiger et al (2013))
- Many countries have introduced Numeracy strategies following the harrowing results from TIMSS and PISA reports e.g Canada, New Zealand, Australia, UK etc

Global Comparisons of Numeracy Teaching

Country	Aspects of integration and implementation
Australia	• Developed Numeracy plan for schools in 1997 • CPD for teachers • Modules on Numeracy embedded in initial teacher education programmes • An abundance of online resources and support for teachers to develop their own resources
New Zealand	• Developed Numeracy plan for schools in 1997 • Collaborated with teachers, researchers and policymakers to develop a numeracy framework teachers can use • Online courses which are funded and run by the Ministry of Education to develop teachers understanding of Numeracy along with providing effective teaching strategies and resources they can use
Wales	• Developed a Literacy and Numeracy plan for all schools in 2012 • Developed a national Numeracy Framework for teachers • CPD courses available online with resources for all teachers • Modules on the teaching and learning of Numeracy integrated into Initial teacher education modules
Ireland	• Developed and implemented a Literacy and Numeracy plan in 2011 • Provided teachers with a one day course on how to embed Numeracy teaching into the classroom for maths teachers only • Maths teachers to act as the Numeracy link person in their school and inform all teachers on the implementation of Numeracy

Numeracy Strategy in Ireland

- In Ireland, Numeracy has become a national priority in recent years.
- The Strategy emphasised that Numeracy should be taught as a cross- curricular subject. Conway (2013) acknowledged that the Literacy and Numeracy Strategy is bringing teacher education into a new age in Ireland.

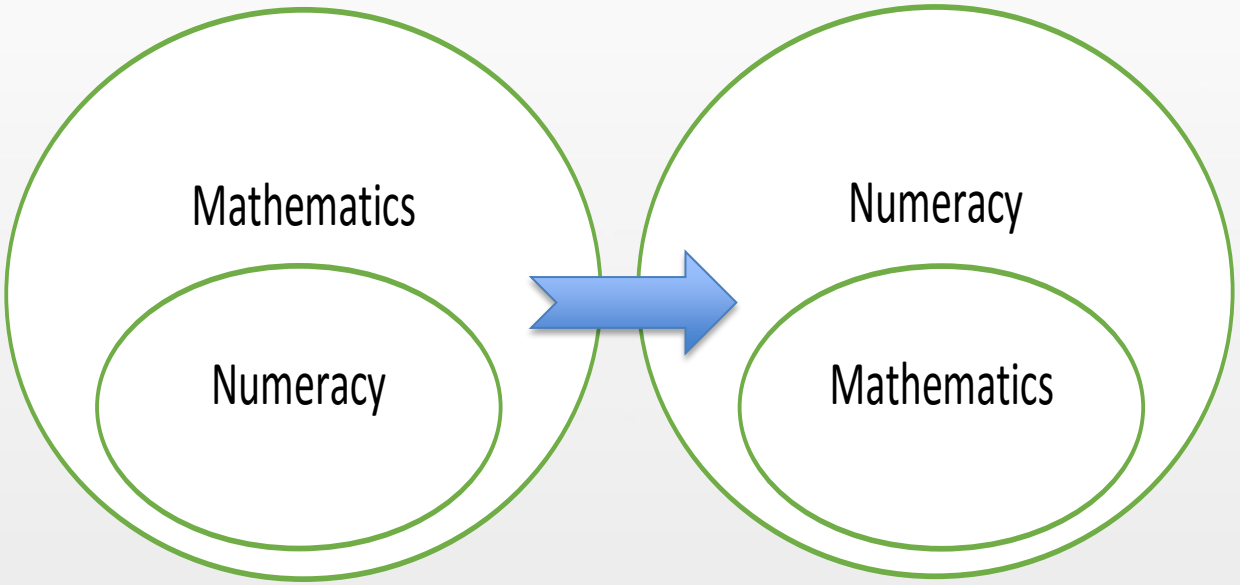


Implementation of Numeracy Strategy in schools

- Teachers need to be able to teach Numeracy in all subjects
- Teachers must first understand what is meant by the term Numeracy
- A recent report carried out in Ireland found that, for Numeracy to be effectively integrated in cross curricular subjects, positive engagement by teachers is essential(DES, 2016).

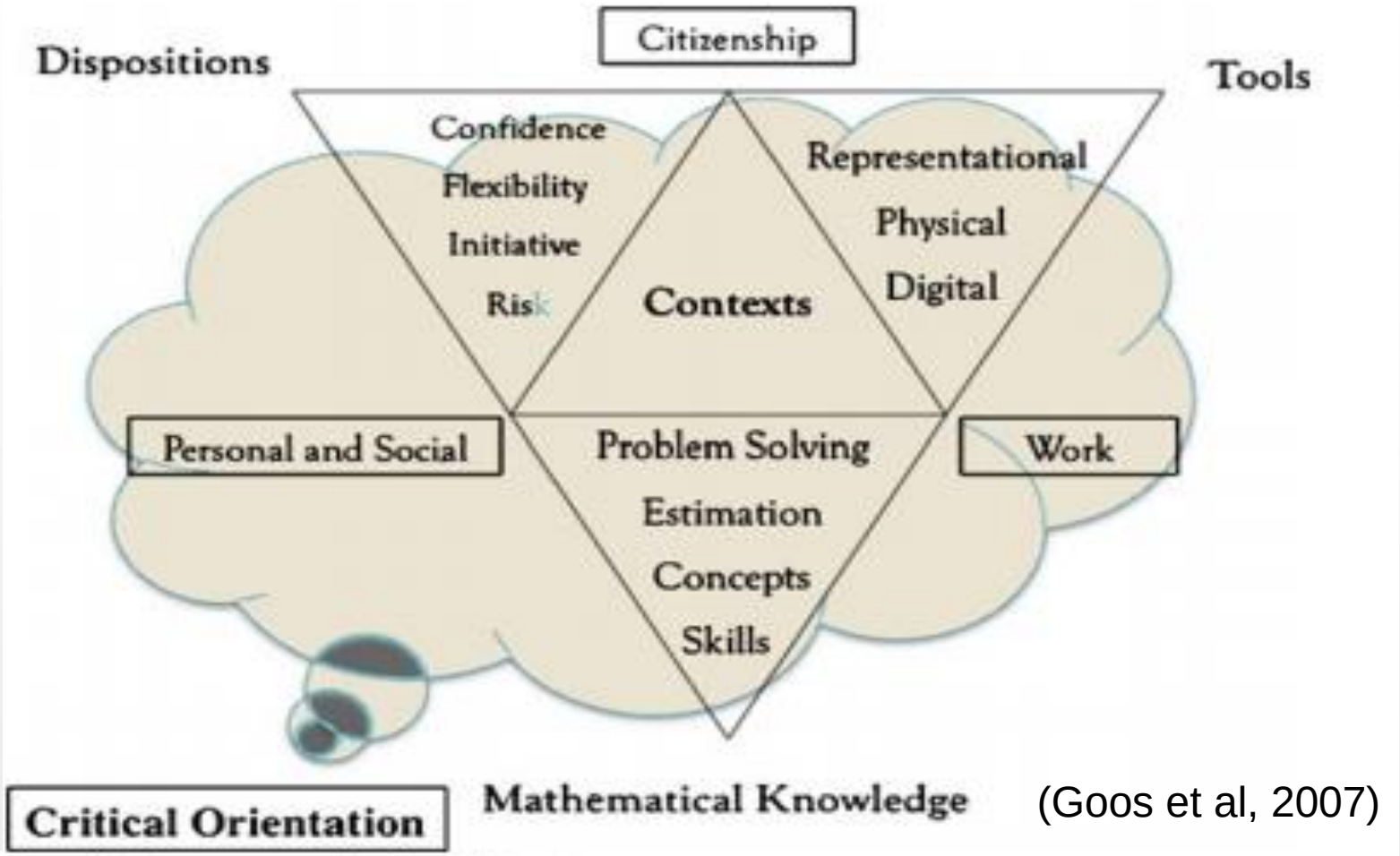
Teachers' perceptions of Numeracy

An evolving framework



(Liljehdal, 2015)

Models for teaching Numeracy



(Goos et al, 2007)

Research questions

1. What definitions of Numeracy currently exist and what do teachers understand the term Numeracy to mean?
2. Do teachers, teaching across a range of different subjects, promote key numeracy concepts in their teaching? How do they do this?
3. How confident do teachers feel about teaching Numeracy skills in their own subject?

Methodology

- Mixed methods design.
- The literature review will inform subsequent survey and interview design to ascertain teachers‘ perception of Numeracy teaching, in their specific subject, as well as the design of a model for teaching Numeracy across all subjects

Future direction of my study

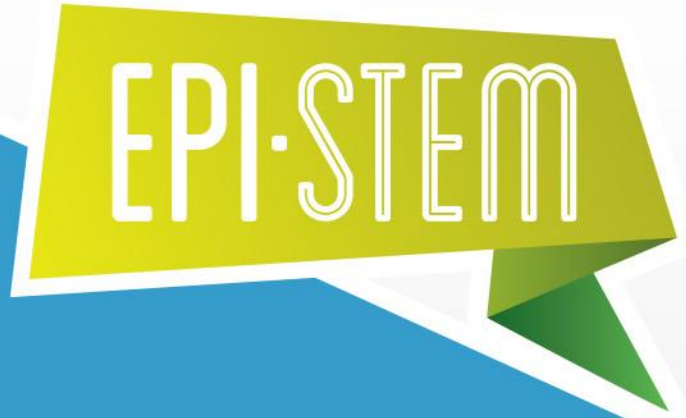
- Analysis of different Numeracy Frameworks
- Development of Numeracy Framework for teachers
- Development of research instrument (Questionnaire)
- Dissemination of questionnaire
- Analysis of data

Conclusion

- In conclusion, it must be acknowledged that the term Numeracy is complex – much more complex than people think.
- If teachers are expected to embed Numeracy in all aspects of their teaching, then policymakers must recognise the need for a clear definition of the term Numeracy, a Numeracy framework to guide their teaching, along with CPD of how best to integrate Numeracy and provide a number of resources teachers can use.

Acknowledgements

- Professor Paul Conway and Dr Niamh O’ Meara



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