

Understanding Narratives: A Pathway Towards Resolving Issues and Challenges in International Cooperation in Mathematics Education

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Purpose of this paper

- To study the issues and challenges in international cooperation in mathematics education by examining the history and the ecosystem of international cooperation projects.

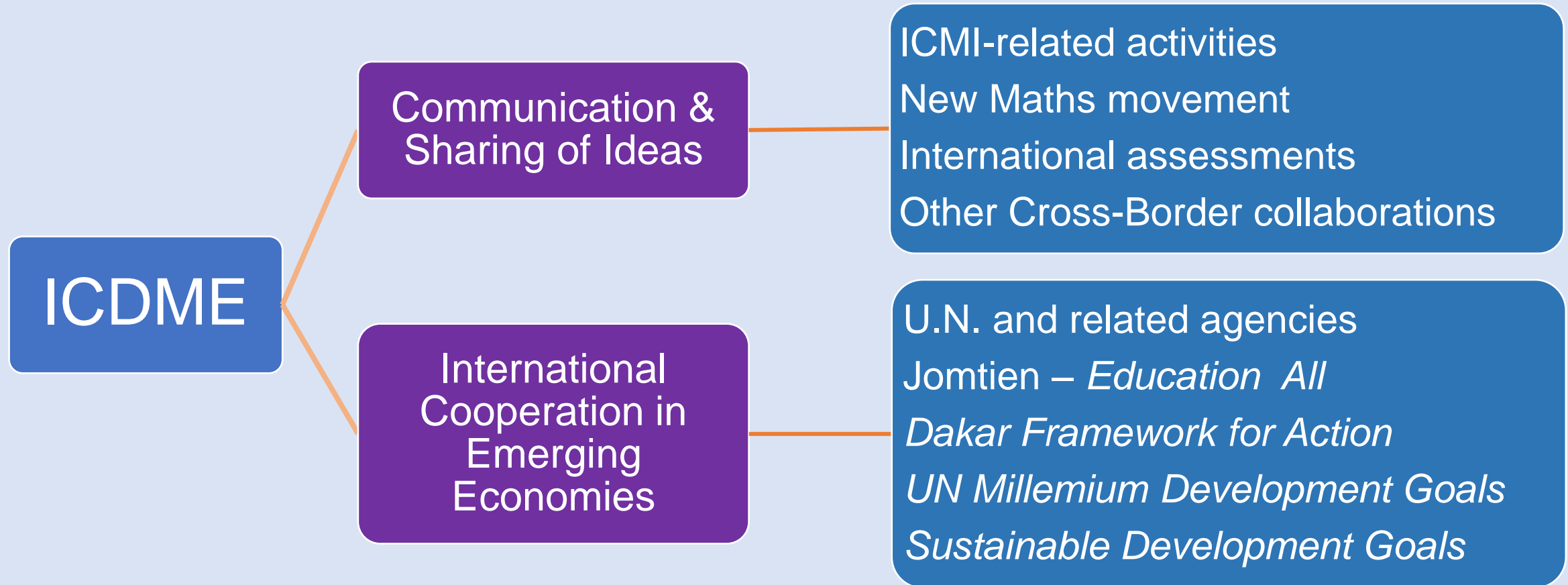
Two Key Events in History which have influenced ICDME

- The Formation of *Internationale L'Enseignement Mathématique* in 1908.
- Development of International Cooperation Post World War II

Background: Development of International Cooperation

Year		Agenda
1908	Formation of <i>Internationale L'Enseignement Mathématique</i> (Reorganized as ICMI in 1952)	Internationalizing Mathematics
Post 1945	Development and reconstruction after the War.	Development to raise living standards. Uneven development among countries Beginning of efforts to narrow the North-South divide. Formation of International Organisations e.g. U.N, UNESCO, UNDP
1990	World Conference on <i>Education for All</i> in Jomtein	<i>Education for All</i> Declaration
2000	World Education Forum in Dakar Millennium Summit of the United Nations	Dakar Framework for Action Millennium Development Goals
2015	United Nations General Assembly	Sustainable Development Goals

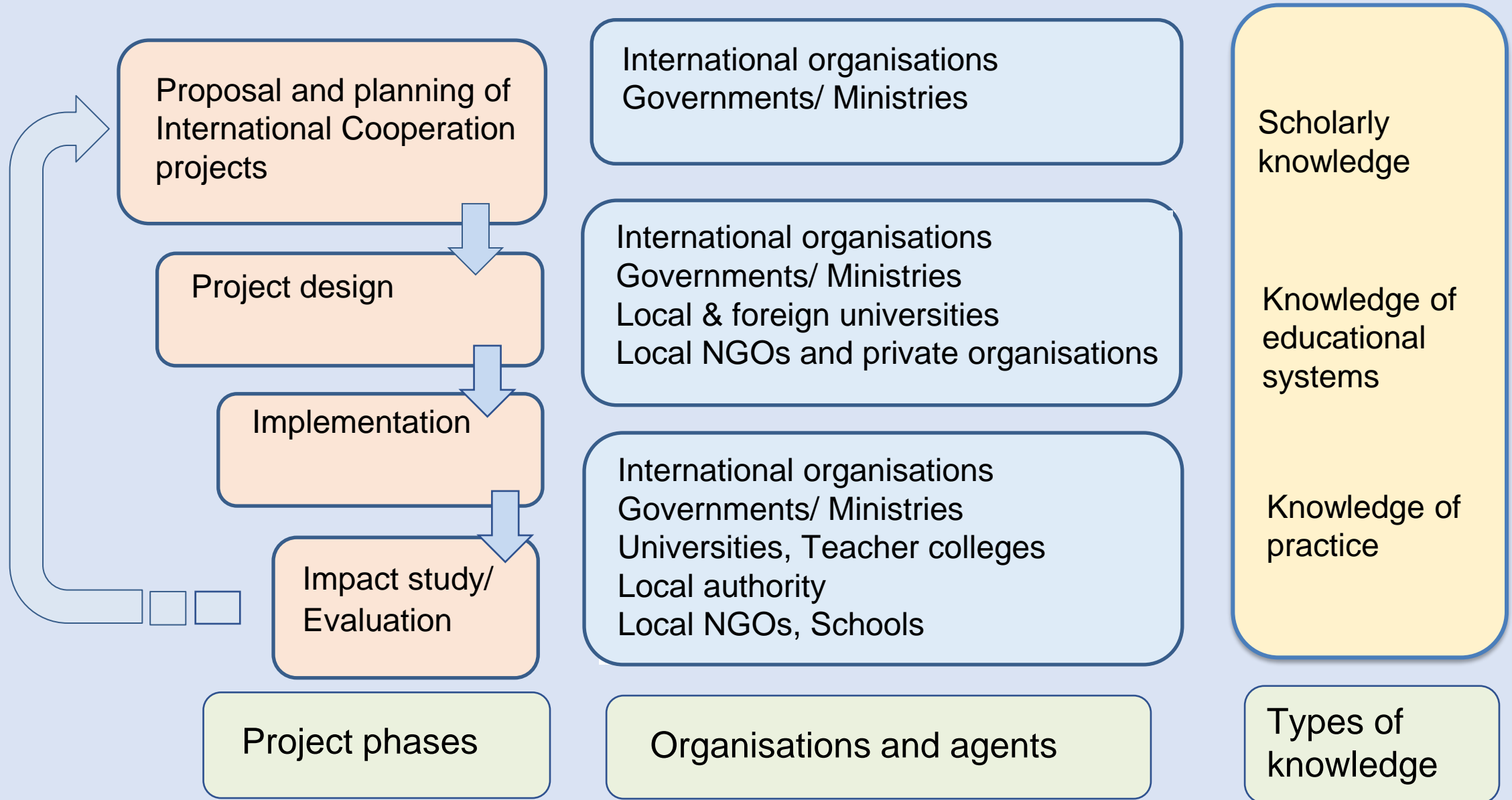
Two Emerging Themes in International Cooperation



Role of Mathematics in International Cooperation

- Mathematics seen as essential for the economic development of future societies
- Utility of mathematics in science and technology, statistics and big data analysis
- Computational thinking and big data analysis has become an important focus in recent years

Complexity of the International Cooperation Ecosystem



- As International Cooperation projects move through the various levels consisting of different agents, the concepts, knowledge and ideas undergo complex processes and transformations
- Similar to what is proposed in the *Anthropological Theory of the Didactic* (Chevallard, 1985), the multi-level ecosystem of International Cooperation is complex

Issues and Challenges

Outer Issues

(Not directly related to maths education)

Locus of authority

- Authority dominates discourse

Institutional vs personal agenda

Practical vs Political/Planned ideas

Inner Issues

(directly related to mathematics education)

Behaviorist vs constructivist approaches

General education theories vs
mathematics education theories

Pure vs applied mathematics

Universal mathematics vs
ethnomathematics

Diverse mathematics classroom cultures

Understanding the Realities in International Cooperation

- A broad spectrum of views is likely to exist in international cooperation
- Need to examine the interactions and discourse amongst the various agents
- Need to uncover the voices of the agents in the discourse
- It is important to understand the narratives that might be hidden in discourse

Some Characteristics of Narratives

- Narratives are accounts or interpretations of events that are expressed based on particular theories or reflecting one's point of view
- diachronic in time (change of meaning over a period of time)
- Meanings of narratives are contextual.
- Carry the narrator's intentional state
- Possess hermeneutic composability
- Narratives can be based either on true events or they could be fiction, in which case it would have the characteristic of truth likeness.
- Narratives convey the intentions of the narrator, sometimes explicitly or at other times in subtle ways so as to protect the interest of the narrator.
- One useful way to detect a narrative in a discourse is through events where the narrator conveys a narrative which indicates a breach in canonicity (conform to acceptable procedure) or which is against accepted norms and opinions.

(Bruner, 1991)

Dispositions of Narratives Related to Knowledge and Beliefs

- Mathematical knowledge and beliefs influence the way the teaching and learning of mathematics is practiced

Disposition of Narratives Towards Aspects of Knowledge and Beliefs

Aspects of Knowledge and Beliefs	Disposition
Views of self towards authority	Receiver of knowledge Constructed knowing <ul style="list-style-type: none">- Able to create knowledge based on the context using subjective and objective strategies
Views of knowledge	Modernist view of knowledge <ul style="list-style-type: none">- Knowledge is objective, depersonalized, value-neutral and easily transferable between persons; prioritize the products of learning Postmodernist view of knowledge <ul style="list-style-type: none">- Prioritize the process and human dimensions of learning;

Disposition of Narratives (contd.)

Aspects of Knowledge and Beliefs	Disposition
Views of knowledge production (Gibbons et al. 1994)	Mode 1 - Rooted in academic disciplines Mode 2 - Rooted in community of practitioners and organizations
Views of management	Aligning (modify) beliefs and knowledge to accomodate elements of Performance-based management Aligning (Modify) elements of Perfomance-based management to accomodate beliefs and knowledge

Conclusion

- To fully understand the challenges in International Cooperation in Mathematics Education it is suggested that a good place to begin is by examining the narratives of the agents
- Examining the dispositions of the narratives can help uncover possible conflicting positions of the agents regarding various aspects of mathematical knowledge and beliefs
- For further theorizing there is a necessity to gather more empirical evidence about the narratives that exist in international cooperation in mathematics education

Thank you for your attention