CHILEAN RESEARCHERS NARRATIVE: ISSUES AND CHALLENGES IN NATIONAL COOPERATION IN MATHEMATICS EDUCATION

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Chilean researchers

- *Some Chilean researches engaged in Lesson Study for improving teacher`s abilities and school mathematics tasks.*
- *They were introduced to Lesson Study International Community, throw the bilateral Chile-Japan program for improving Chilean School Mathematic Teaching, 2006 to 2008.*
- *Chilean researchers from* Pontifical Catholic University of Valparaíso, Chile, *looks for systematize* ***an ecosystem of cooperation in mathematics education*** *including a community of agents from various institutions and organizations that interact at local, national as well as international levels.*
- *The aims of the community is to create, share and evaluate sequences of tasks and their administration for provide appropriate experiences of learning in mathematics.*

Cooperation as Communication

- **comunication** is one of the valuest components of international cooperation.
- cooperation as **communication increased** in Internet era, and more yet because of pandemic effects in the situation of Chile.
- In Chilean mathematics education, **comunication** appears as a **regulated way of cooperation since 1982**, as the first meeting of the Chilean Society of Mathematic Education, SOCHIEM, providing the first bianual national meetings.

MATHEMATICS EDUCATION FOR EXERCISING CITIZENSHIP

- In this era, the great challenge for education, in general, and for mathematics education, in particular, is to offer possibilities for **exercising citizenship** that can understand and criticize the highly technological society, which is a core motivation of the critical mathematics education.
- Skovmose (2016) critiques the universal paradigm of teaching where all the students are warm and quiet, even motivated and not hungry.
- For better understand about **how negotiated solutions** emerge in the complex ecosystem of the communities.
- In this talk, we provide ours narratives as teacher educators and researchers.

A FRAME FOR COLABORATION IN CHILE

- In Chile, curricular decisions occur in two levels, according to the **Parliament** and according to the **president** of the country.
- Usually curricular discussion in the second level is conducted by **specialist agents** beside government authority.
- **Prestigious of the agents** is provided by ranking of his or her nation in international tests as TIMSS or PISA, which provides public credibility to their appreciations.
- The **curricular implementation** occur throw **texts** distributed by the government and **every day lessons** implemented by school teachers. Texts are selected by **national contest** and teachers are developed by less than 20 selected Universities and around 700 independents entities that provide educative technic assistance to school throw the country.

A FRAME FOR COLABORATION IN CHILE

- The possibility to create a **robust community of practice** of well know group of **lead teachers** is a challenger to the diverses territories i n Chile.
- It is easy to recognize teachers that obtained a master or doctoral degree, but it is not clear **how to select those expert teachers** needed to support teachers in their communities.
- In Chile, **The creation of communities of practice** of teachers that improve using lesson study looks limited by the today competitive frame between teachers, schools, and academics.
- The vision **of communities of practice** could be considered in a new paradigm

CHALLENGES IN MATHEMATICS EDUCATION COOPERATION

- The narrative will be focused in the five inner issues of mathematics education identified by Cheah & Isoda (2021) for supporting international cooperation.
- (a) The debate between behaviourist and constructivist approaches..
- (b) The selection of **general or mathematics education theories**, while one emphasizes mastery learning and multiple intelligences the former attends mathematical thinking, problem solving and learning trajectory.
- (c) **Pure an applied mathematics**. Emphasizing real life applications which would make it more interesting, but the ability of the learners to grasp the level of abstraction increase according to the learning experiences and effort compromised.

CHALLENGES IN MATHEMATICS EDUCATION COOPERATION

- (d) **Universal and local mathematics.** According to ethno-mathematics, mathematics practices can be emerged from the local culture, outside of the school setting (Terezinha et al., 1993; Gerdes, 1994; Barton, 1996), so the formal universal mathematics curriculum is therefore not necessarily.
  - One of the challenges for the international cooperation is to make **room to local practices** into the development of the formal mathematical instruction.
- (e) Creation of **mathematics classroom culture** (Cobb et al., 2011, Lewis et al., 2009), that include sequence of activities related to the nature of mathematics discourse and that include as accepted norm the way of teacher-student and student-student interacting.
  - Additionally, it should be considered the practices of the learners and teachers outside classroom, even examining **the greater culture of the community**.

CHILEAN challenges in Mathematics Education Cooperation

- Cheah & Isoda (2021) consider the **mathematical knowledge and beliefs of the agents would impact** on the way projects in international cooperation in mathematics education are designed, planned and implemented.
- So they focus on the dispositions in the narratives that relate to the various aspects of knowledge and beliefs of mathematics.
- Ultimately, the aim for understanding these narratives is to strive for sustainability and improvements in the quality of mathematics education globally.

LESSON STUDY FOR IMPROVING MATHEMATHICS TEACHING IN CHILE

- We image the massive incorporation of Lesson Study in Chile using human resources from municipal administration working in action-research activities.
- The dissemination of the Lesson Study occurred throw the modality of mention programs (postgraduate degrees) for in-service teacher training, as well as in the reformulation of initial teacher training programs.
- The **Lesson Study remain as local initiatives at Universities** as a Laboratory, as is the case of the Lesson Study Groups: GEC-PUCV https://estudiodeclases.cl/
- Recently Lesson Study was included to support the 10% of critical schools (2020-2021) throw the ”Suma Primero en Terreno” program that was extended for 2022-2024 https://bibliotecadigital.mineduc.cl/handle/20.500.12365/14404

CONCLUSIONS

- This paper expresses a narrative of Chilean researches evolved in Lesson Study Community for 14 years.
- The narrative is related to their knowledge and believes about international and local cooperation, both as communication and as a community of practice.
- The main ideas provided refers to the requirements of an ecosystem to scaffolding teacher development for mathematics teaching throw preschool to middle school in relation to multi-territorial requirements according to multilevel aspirations.

CONCLUSIONS

- Critical inner issues were considered in the narrative.
- The relation between **behaviourist and constructivist** approaches, the selection of **general educational theories and specific** mathematics education theories, the understanding of **universal mathematics**; and the creation of mathematics **classroom culture**.
- Additionally, two outer issue were considered, the structure and **political regulation** of education, and the **multilevel organizations** that participle in the implementation the mathematic education in the country.

Thnks

https://estudiodeclases.cl/