WG 3:
Instrumentation – competencies – design capacity – expertise

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Teachers use resources in order to support their teaching, to support students' learning, and to advance their own pedagogical and content knowledge. **Using resources requires particular knowledge and skills**. These are conceptualized within different theoretical frames as **competencies, aspects of design capacity, teacher expertise, professional knowledge, or utilization schemes** within the instrumentation process.

The working group focuses on empirical studies, theoretical advancements and methodological contributions related to these aspects of using resources within the documentational approach or other frameworks related to the following questions:

1. How are these aspects of teachers' use of resources approached theoretically and methodologically?

2. How do these aspects develop over time in teachers' practices?

3. How do these aspects relate to teachers' previous experiences and knowledge?

4. How do these aspects relate to features of the resources and the subject matter?

5. How do these aspects relate to teachers' capacity to re-design them during their teaching action?

contributions	mathematics	other
17 oral communications	16	1 language 1 physics 1 history
1 poster	1	

How is teacher's use of resources approached theoretically and methodologically?

- **Eye-tracking** (Lorraine Males, Ariel Setniker, & Leslie Dietiker) and **tagging** (Jason Cooper, Shai Olsher, & Michal Yerushalmy) as methods for investigating teacher's perceptions of resources
- **Networking of theories** (documentational approach and design capacity associated with other theories)
- **Extension of theories** by introducing 'new' theoretical notions
  - Documentational expertise (Chongyang Wang)
  - Double documentation process (Alain Bernard)

How do competencies, aspects of design capacity, teacher expertise, professional knowledge, or utilization schemes **develop over time in teacher's practices?**

How do competencies, aspects of design capacity, teacher expertise, professional knowledge, or utilization schemes **relate to teachers' previous experiences and knowledge?**

- Role of **interventions** (Iresha Ratnayake, & Michael Thomas)
- Developing a **language for rationalizing about resources** (Jason Cooper, Shai Olsher, & Michal Yerushalmy)

How do competencies, aspects of design capacity, teacher expertise, professional knowledge, or utilization schemes **relate to features of the resources and the subject matter** and institutional and cultural contexts**?**

- **Different representations of tasks** (paper-pencil, material, digital) afford different utilization schemes of the tasks by students (Anderson Rodrigues, Paula Baltar, & Franck Bellemain)

- **Improvement and design of new resources** to be incorporated into teacher's resource systems (Ana Barbosa & Isabel Vale, Henri-Claude Argaud, Jacques Douaire, & Fabien Emprin; Ok-Kyeong Kim; Fangchun Zhu)

- **Research resources** and resources within different activity systems (Hussein Sabra, Suzane El Hage)

How do competencies, aspects of design capacity, teacher expertise, professional knowledge, or utilization schemes **relate to teacher's capacity to re-design resources during their teaching action?**

How to foster teacher's competencies, design capacity, expertise, professional knowledge, or utilization schemes?

- Role of **collectives** (Nolwenn Quéré; Iresha Ratnayake, Mike Thomas)
- documentation work and **awareness** (Alain Bernard; Laurence Leroyer)
- **educative resources** and support for teacher learning and PD (Jana Visnovska & Jose Luis Cortina; Jason Cooper, Shai Olsher, & Michal Yerushalmy)

Different roles of the framesworks

Frameworks for describing and analyzing teacher's use of resources	Resource for reflection and developing teacher's awareness
Katalin Gosztonyi	Alain Bernard
Ming-Yu Shao	Laurence Leroyer

Emerging issues

- **Selection of resources** as part of the documentational genesis?
- Place of language
- **Role of students** within the documentational process and interrelatedness of teacher's and students' use of resources.
- **Evaluation of design capacity / teacher's selection of resources**: curriculum resources provide guidance for **proper decisions** / support for the selection of the **right resources** (Ok-Kyeong Kim; Magally Martinez, Rene Cruz, & Anabelem Soberanes)