GEOMETRIC MODELLING
physical and digital resources combined

Diego Lieban
diegolieban@yahoo.es
JKU - Austria / IFRS - Brazil

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THEORETICAL FRAMEWORK

• Modelling and application of real-life-problem;

- Multiple representations;
- Multiple solution paths;

Figure 1: adapted from Siller & Greefrath (2009)
1) HOW CAN PROSPECTIVE TEACHERS USE THE COMBINATION OF PHYSICAL AND DIGITAL GEOMETRIC MODELING OF JOINTS TO PROMOTE COLLABORATION, INTERDISCIPLINARY AND MULTIPLE SOLUTION STRATEGIES FOR MATHEMATICS LEARNING?

2) WHAT KIND OF PEDAGOGICAL AND TECHNICAL SUPPORT DO TEACHERS NEED TO IMPLEMENT THE COMBINATION OF PHYSICAL AND DIGITAL GEOMETRIC MODELING IN THEIR CLASSROOMS?

3) BASED ON THE FIRST TWO QUESTIONS, HOW CAN PHYSICAL AND DIGITAL GEOMETRIC MODELING BE INTEGRATED AND PROMOTED IN PRE- AND IN-SERVICE MATHEMATICS TEACHER TRAINING?
PRELIMINARY FINDINGS

some registers focus on...

…which sense they are using sliders in their digital modeling;

…how the participants connect both models (it means, whether the models are suitable one each other, or not);

…how accurately the participants represent some movements or objects;

…how the participants transfer planar geometric concepts to spatial geometric concepts and how the software supports them in this sense;
DATA COLLECTING

- Interviews
- Observations
- Questionnaires
- Brazilian documentation

- Activities
- Group interaction
- Peer interaction
- Curricula
- National exams
METHODOLOGY

qualitative research

• First Round: participants have modeled a SEESAW in both ways, physically and digitally;
  - 20 prospective teachers (10 seesaws teams)
  - different handcrafts and materials for physical models
  - geogebra and blender for digital models
  - group and team meetings

• Second Round: participants choose a REAL ARTICULATED MECHANISM to model digitally;
  - 3 teams following up their ideas (so far)
SAMPLES

\[ \mu = 1.85 \]
\[ \beta = 0.09 \]

\[ \kappa = 193^\circ \]
\[ \delta = 0.4 \]
\[ \kappa = 0.23 \]

Thank you
REFERENCES


