

## **Analysis of a primary pre-service teacher's instrumental orchestration through Artifact-Centric-Activity-Theory**

This study investigates the explanatory power of Artifact-Centric-Activity-Theory (ACAT) framework (Ladel & Kortenkamp, 2016) through its acquaintance with a primary pre-service teacher's (JS) teaching episodes, in which JS orchestrates her dynamic geometry concept with 17 primary children (6 girls & 11 boys) of Grade 4 in a computer based teaching-learning environment. An adapted ACAT model is used in this study that describes: the process of instrumental genesis (Artigue, 2002), the different levels of activity theory in internalization and externalization mediated by dynamic geometry environment, and social interaction in primary classroom in view of instrumental orchestration (Drijvers & Trouche, 2008).

JS introduced *GeoGebra Classic (Geometry)* dynamic geometry system to the children who are using it for the first time. The following week, JS meticulously orchestrated the “rotational symmetry” episode. Her instrumental orchestration is interpreted through a didactical configuration, an exploitation mode and a didactical performance (Drijvers, 2012). JS used a central screen connected to her laptop; the children were working individually on computers. They engaged themselves with an instrument “rotate about a point” of GeoGebra pacing differently corresponding their heterogeneous performance levels. Observation, JSs lesson plan, screen recording of children's engagement with the tasks on computers, JS questionnaire and interview are used to collect data about JSs design and orchestration of “rotational symmetry”. Analysis of the collected data suggests that the ACAT framework is productive for analyzing JSs competencies, particularly in combination with the theory of instrumental orchestration perspectives. JSs orchestration found to be effective as evidenced by the screen recordings, in which the children appropriated the instrument to rotate the triangle about a point although some children had difficulties initially.

### **References**

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