THE USE OF DISCURSIVE ANALYSIS FOR UNDERSTANDING PROSPECTIVE TEACHERS' GEOMETRIC THINKING

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The study revisits the van Hiele theory (1985) with a discursive lens to investigate prospective teachers' geometric thinking through their word use, visual mediators, routines and endorsed narratives (Sfard, 2008). The van Hiele Geometry test developed by Usiskin (1982) were used as a pre- and post-test to gather initial information on changes of the prospective teachers' geometric thinking. Clinical interviews were conducted to investigate changes in students' geometric discourses. Aligning prospective teachers' test results with analyses of their geometric discourse from the clinical interviews, we found variations of geometric discourses at the same van Hiele level among different prospective teachers, as well as changes in geometric discourses within a van Hiele level for the same prospective teacher (Wang, 2011). For example, Sam's van Hiele geometry tests suggested that there was no change after a semester of instruction in van Hiele levels, but the analyses of Sam's geometric discourses showed changes in her word use, a change in her understanding of related geometric concepts, and changes in her substantiation routines. Sam's routine procedures operated at an object level at the pre-interview, and ten weeks later she was able to use endorsed narratives (i.e., mathematical axioms) to verify her claims at the post-interview. The discursive framework, complimenting with the van Hiele levels, provided tools allowing for the detailed examination of prospective teachers' geometric thinking. It helped to understand learning as change in discourses while students move toward a higher van Hiele level. In particular, a fine-grain analysis of prospective teachers' mathematical word use reveals valuable insight toward their understanding of related concepts. Teachers' routines offer valuable information about what they do as a course of action to endorse narratives, and help differentiate whether a prospective teacher reasons at an object level or a meta-level.

References


