

PROFESSIONAL TEACHER NOTICING AS EMBODIED ACTIVITY

Karl W. Kosko
Kent State University
kkosko1@kent.edu

Jennifer Heisler
Kent State University
jheisle4@kent.edu

Enrico Gandolfi
Kent State University
egandolf1@kent.edu

Keywords: Embodiment and Gesture; Teacher Knowledge; Technology.

There is growing evidence to suggest that construction of knowledge is an embodied activity (Alibali & Nathan, 2012; Barsalou, 1999; Gallese & Lakoff, 2005). We conjecture that embodied cognition is a useful theoretical lens for explaining teachers' professional noticing. Evidence from eye-tracking studies suggest that experienced secondary teachers process visual events in a recorded classroom more quickly, while preservice teachers (PSTs) scan the room more frequently and with fewer fixations on particular students or events (van den Bogert et al., 2014). More recently, Kosko et al. (2019) observed that differences in where PSTs attended when watching a 360 video of an elementary math lesson coincided with differences in written descriptions of their noticing. 360 video records in a spherical direction, and PSTs can move their head to determine where in the classroom they attend. Given such evidence, we sought to further examine the relationship between where PSTs attend in watching 360 video and what they describe in written noticings. To this end, the purpose of this study is to report preliminary evidence supporting a theory of professional noticing as embodied activity.

Participants in this study included four elementary preservice teachers (PSTs) at the beginning of their teacher education coursework (sophomores). Using Oculus Go headsets to record their viewing session, participants watched a 360 video of third-grade students informally explored the Commutative Property. After viewing the video, PSTs wrote what they noticed to be significant moments for the teaching or learning of mathematics. We used Systemic Functional Linguistics (SFL) to examine PSTs' written noticings. SFL examines how grammar functions to convey meaning (Eggins, 2004). In this analysis, we examined how transitive processes conveyed experiential meaning of referents in the grammar. We then examined how this experiential meaning was related to recordings of where PSTs attended in the video. One PST wrote "The teacher **was moving** all around the classroom and he [teacher] **was asking** students to work together..." The first bolded words signify material processes, which corresponded to the PST moving their head to attend to the teacher walking around the classroom at various points. The second bolded words signify a verbal process. Interestingly, the PST did not always visually track the teacher when he was asking questions. Contrasting this example, a second PST, who consistently used material processes but no verbal processes in their written noticings, always looked at the teacher when the teacher was talking. Analysis of these patterns is ongoing, but initial findings suggest PSTs' attending manifests in both auditory and visual means, which are represented in how meaning is conveyed in their written noticings.

Acknowledgements

Research reported here received support from the National Science Foundation (NSF) through DRK-12 Grant #1908159. Any opinions, findings, and conclusions/recommendations expressed in this paper are those of the author(s) and do not necessarily reflect the views of NSF.

References

- Alibali, M. W., & Nathan, M. J. (2012). Embodiment in mathematics teaching and learning: Evidence from learners' and teachers' gestures. *Journal of the Learning Sciences, 21*(2), 247-286.
- Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences, 22*, 577-609.

In: Sacristán, A.I., Cortés-Zavala, J.C. & Ruiz-Arias, P.M. (Eds.). (2020). *Mathematics Education Across Cultures: Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, Mexico. Cinvestav / AMIUTEM / PME-NA. <https://doi.org/10.51272/pmena.42.2020>

- Beauchamp, M. S., & Martin, A. (2007). Grounding object concepts in perception and action: Evidence from fMRI studies of tools. *Cortex*, *43*, 461-468.
- Eggins, S. (2004). *An introduction to systemic functional linguistics* (2nd ed.) New York: Continuum.
- Gallese, V., & Lakoff, G. (2005). The brain's concepts: The role of the sensorimotor system in conceptual knowledge. *Cognitive Neuropsychology*, *21*, 455-479.
- Kosko, K. W., Ferdig, R. E., & Zolfaghari, M. (2019). Preservice teachers' noticing in the context of 360 video. In S. Otten, A. G. Candela, Z. de Araujo, C. Haines, & C. Munter (Eds.), *Proceedings of the 41st annual meeting of the North American Chapter for the Psychology of Mathematics Education* (pp. 1167-1171). Saint Louis, MO.
- van den Bogert, N., van Bruggen, J., Kostons, D., & Jochems, W. (2014). First steps into understanding teachers' visual perception of classroom events. *Teaching and Teacher Education*, *37*, 208-216.