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COMPARING EXPERT AND NOVICE TEACHERS' NOTICING WITH EYE-TRACKING IN 360 VIDEO

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Teacher noticing involves attending to pedagogically significant events amongst an array of occurrences in the classroom, and using one's professional resources to reason about those events (Jacobs et al., 2010; van Es et al., 2017). Initially, more novice teachers may focus on the teacher or generic classroom behaviors, while more knowledgeable teachers focus on students and those students' mathematical reasoning (Huang & Li, 2012; Teuscher et al., 2017). Scholars studying teachers' eye-tracking data with standard videos have found preservice teachers (PSTs) attempt to focus on more students, with less time per student, and usually those proximally closer to the camera, whereas inservice teachers (ISTs) are more focused (Huang et al., 2021). In a similar manner, analysis of PSTs viewing of 360 video has found that those attending to students' mathematics with more specificity tend to focus on fewer students for longer durations (Kosko et al., 2021) and position students more in the center of their field of view (FOV) (Kosko et al., 2022). This scholarship provides evidence that where teachers gaze with their eyes (Huang et al., 2021) and turn their body/head (Kosko et al., 2022) are related to what and how they attend to in the classroom. The present study represents an effort to combine both technological approaches by examining ISTs ($n=4$) and PSTs' ($n=10$) professional noticing in relation to their eye-tracking data within a 360 video on the Commutative Property of Multiplication. Analysis of written noticing suggest that ISTs attended to students' reasoning about the property while PSTs focused on students' procedural knowledge. Results from eye-tracking data suggest ISTs (42.46%) and PSTs (47.23%) gazed at children for similar proportions of time. However, ISTs showed evidence of looking at different students and their work, as conveyed with larger average gaze distances from students ($U=34.00, p=.048$).



Figure 1: Cumulative Raw Gaze Data for Experts (left) and Novice (right) Teachers.

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References

- Huang, R. & Li, Y. (2012). What matters most: A comparison of expert and novice teachers' noticing of mathematics classroom events. *School Science and Mathematics*, 112(7), 420–432. <https://doi.org/10.1111/j.1949-8594.2012.00161.x>
- Huang, Y., Miller, K. F., Cortina, K. S., & Richter, D. (2021a). Teachers' professional vision in action. *Zeitschrift für Pädagogische Psychologie*. <https://doi.org/10.1024/1010-0652/a000313>
- Jacobs, V. R., Lamb, L. L. C., & Philipp, R. A. (2010). Professional Noticing of Children's Mathematical Thinking, *Journal for Research in Mathematics Education*, 41 (2), 169-202. <https://www.jstor.org/stable/20720130>
- Kosko, K. W., Ferdig, R. E., & Zolfaghari, M. (2021). Preservice teachers' professional noticing when viewing standard and 360 video. *Journal of Teacher Education*, 72(3), 824–841. <https://doi.org/10.1177/0022487120939544>
- Kosko, K. W., Heisler, J., & Gandolfi, E. (2022). Using 360-degree video to explore teachers' professional noticing. *Computers & Education*, 180. <https://doi.org/10.1016/j.compedu.2022.104443>
- Teuscher, D., Leatham, K. R., & Peterson, B. E. (2017). From a framework to a lens: Learning to notice student mathematical thinking. In E. O. Schack, M. H. Fischer, & J. A. Wilhelm (Eds.), *Teacher noticing: Bridging and broadening perspectives, contexts, and frameworks* (pp. 31-48). Springer. https://doi.org/10.1007/978-3-319-46753-5_3
- van Es, E. A., Cashen, M., Barnhart, T., & Auger, A. (2017). Learning to notice mathematics instruction: Using video to develop preservice teachers' vision of ambitious pedagogy. *Cognition and Instruction*, 35(3), 165-187. <https://doi.org/10.1080/07370008.2017.1317125>