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Facilitating the genesis of functional working spaces in guided explorations.

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Summary: Approximating given real-valued functions by affine functions is among the most basic activities with functions. In this study we examine two contexts in which two such approximations are performed. The first involves a microscopic representation of functions for the study of tangents; the second a macroscopic representation of functions for the study of asymptotes. In the proposed research, we conducted three sessions to observe how small groups of college freshmen worked in a setting of multiple dynamical representations including algebraic, graphic and CAS (computer algebra system) views. This enabled the observation of individual Mathematical Working Spaces (iMWS). The analysis of students' answers leads us to propose an enrichment of the MWS model. Specifically, this analysis suggests that educational resources could foster the geneses described in the MWS model: observation for visualizing, drawing for constructing and justification for proving.

Classification: I20 U70 D40 C70

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