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Embodied approach to the concept of vector and its application.

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Summary: The current mathematical education calls for a learning environment from the constructionism perspective that actively creates mathematical objects. This research first analyzes JavaMAL's expression 'move' that enables students to express the agent's behavior constructively before they learn vector as a formal concept. Since expression 'move' is based on a coordinate, it naturally corresponds with the expression of vectors used in school mathematics and lets students take an embodied approach to the concept of vector. Furthermore, as a design tool, expression 'move' can be used in various activities that include vector structure. This research studies the educational significance entailed in JavaMAL's expression 'move'.

Classification: H64 D84 E44 G74 U74

Keywords: vector education; embodied expression; representation; covariational reasoning; probabilistic processes