

## Dynamic visualizations in the AlgoRythmics environment

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The study we have performed concentrates on the schematic versus realistic topic with particular focus on the human movement effect when the content to be learned takes the form of a computer algorithm. Since computer algorithms are inherently abstract processes, illustrative representations of them can be a schematic or realistic visualization. As a realistic visualization involving human movement, we adopted an algorithmic dance choreography from the AlgoRythmics collection. For the role of schematic visualization an abstract computer animation was used. The experiment included the following conditions: schematic-twice, realistic-twice, schematic+realistic and realistic+schematic (presented in succession). Our most important finding is that realistic dynamic visualizations can be more effective than schematic ones if they involve human movement. This result is apparently contrary to the conclusions of some relevant previous research in the field of schematic versus realistic dynamic visualizations [1,2], but it is in line with recent findings regarding the so-called human movement effect [3]. In addition, results suggest that to benefit maximally from realistic visualization, students need to have previously viewed it or to have previously viewed the isomorphic schematic presentation of it.

## References

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- [3] Castro-Alonso, J. C., Ayres, P., Wong, M., Paas, F., Learning symbols from permanent and transient visual presentations: Don't overplay the hand, *Computers and Education* **116**, (2018) 113.