Computer model based audio and its influence on blind students' learning about gas particle behavior

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ABSTRACT

This paper focuses on the need of students who are blind to access science curriculum learning materials. Net Logo is a widely used computational agent-based modelling language that enables exploring and constructing models of complex systems. The Listen-to-Complexity environment is based on the Net Logo and involves sonified feedback that was adapted to users who are blind. This study examines the scientific conceptual knowledge, systems reasoning, and Kinetic Molecular Theory of gas in chemistry that were learned as a result of interaction with the Listen-to-Complexity environment by people who are blind as shown in their answers to a pre- and post-test. Five participants who are blind volunteered to participate in this research. The preliminary findings are encouraging with regard to the sonified model's efficacy in providing access to central and difficult scientific concepts, even when the target phenomenon is complex. The benefits of this longitudinal research are likely to have an impact on science education for students who are blind, supporting their inclusion in the K-12 academic curriculum on an equal basis with sighted users.