

Michigan State scholar leads effort to reform genetics instruction

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Most middle-schoolers struggle to grasp the introductory concepts of genetics, a field of study considered crucial to advancing solutions to health problems and disease such as cancer, according to a study led by a Michigan State University researcher.

In the journal *Science Education*, Michelle Williams suggests genetics and heredity lessons should be taught with broader context and in a visually stimulating manner via computer technologies.

Williams, assistant professor of education, has landed a \$2.3 million grant from the National Science Foundation to do just that. With the five-year grant, Williams and a team of fellow researchers will develop web-based genetics curricula for students starting in fifth grade.

"A lot of genetics happens at the [microscopic level](#) and it's hard for students to visualize," Williams said. "The goal is to get the students excited about science and keep that excitement going."

In the published study, a group of seventh-grade students completed a web-based unit on genetics and were given assessments. Although improvement was shown, the students still struggled to understand cell function and [genetic inheritance](#).

But state and national academic standards indicate students should comprehend genetic-related concepts as early as elementary school. Understanding the basics of genetics is considered crucial to helping

older students grasp the more advanced science topics such as the structure and function of DNA and RNA.

"We need to better understand how students make sense of genetics not only in high school, but also when they are first introduced to this concept," Williams said.

With the grant, Williams and colleagues will create a more advanced genetics unit for students in fifth, seventh and ninth grades in two school districts. Because the instruction is web-based, the students can interact with each another as well as with their instructors. Researchers will monitor trends in learning and make changes to the system as needed.

Williams said it's important that students in early grades not just read about genetics in a textbook, but see the concepts in simulations and animations.

"With this system, a teacher can freeze everyone's computers to highlight an idea, for example, or teachers and students can do instant messaging," Williams said. "They'll have access to evidence-based genetics curriculum in a state-of-the-art environment that promotes learning, and that's what is exciting."

Provided by Michigan State University

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