

## Victoria V. Volkis

Assistant Professor, Chemistry — The University of Maryland Eastern Shore

### OWL Helps Instructors Rise to the Challenge of Engaging Organic Chemistry Students and Improving Their Performance

Victoria Volkis has been an assistant professor of chemistry at the University of Maryland Eastern Shore (UMES) since the fall semester of 2010. She did post-doctoral research at the University of Colorado at Boulder, and her resume includes teaching stints at Technion-Machon Technologi Le' Israel and another Israeli university. Currently, Victoria leads regular and Honors courses and lab in organic chemistry. She also teaches polymer chemistry, instrumental analysis, and research courses.

A historically black institution, UMES is growing rapidly and making the transition to a research institution. It attracts students from diverse backgrounds, and Victoria has found that OWL from Cengage Learning—an online learning solution developed at UMass Amherst—has helped students at all levels perform better in her organic chemistry class and on homework assignments. She particularly likes being able to select homework questions to match differing levels of skill and the rich variety of instructional approaches integrated into OWL.

#### COURSES AND PARTICIPANTS

Many UMES students come from low-income households. The students in Victoria's Honors course are typically working hard to prepare themselves for medical school as well as pharmacy and doctoral programs. Students in other sections are taking organic chemistry as part of a sequence of courses in the general education curriculum for natural science majors.

Victoria teaches hybrid courses, which involve four hours of in-class lectures and discussions per week and online assignments. "I estimate that my students spend about 40 percent of their time online and 60 percent of their time in class," she says. "As an American Chemical Society-certified program, we cannot be fully online, but that component of my courses is very important to my students' progress."

In a typical semester, Victoria teaches organic chemistry to approximately 24 Honors students and up to 140 others in regular sections of the course. She is also actively involved in research and in providing other services to the academic community—making for a full schedule.

#### THE CHALLENGES

Victoria's students come from widely varying academic backgrounds, which creates unique teaching challenges. She must deliver basic knowledge of organic chemistry, while striving to keep those who are more advanced in their studies engaged in the coursework.

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#### CHALLENGES

- **Students' academic backgrounds and their levels of preparedness vary.** Professors are challenged to present basic knowledge while ensuring those who are more advanced stay engaged.
- **With students pursuing different majors in the same class,** instructors must be fair and effective in their approach to teaching the material.
- **Low-income students rely on the school's pool of computers,** and it is important that an instructional solution not require add-ons and supplemental applications to function.

#### SOLUTIONS

- OWL: Online Web Learning for Organic Chemistry

#### RESULTS

- **Feedback is instant,** and students are guided immediately to tutorials, simulations, and visual exercises that help them master the topic and increase their sense of engagement.
- **Instructors can select assignments with varying levels of difficulty,** making it possible to adapt instruction to students with different backgrounds and levels of mastery.
- **Answers to questions are accurate,** ensuring a high quality learning experience and saving instructors the time involved in checking.
- **Students have significantly improved their performance,** which is critical to the progress of their academic careers.

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*continued from page 1*

As the sole organic chemistry instructor at UMES, she also teaches students who are pursuing different majors. “What I am concerned with,” she says, “is how to be effective teaching a course that addresses multiple academic focuses and treats everyone fairly.”

In the past, technical problems have been more of an issue than they are now. Victoria notes that some educational packages have required students to download add-ons and supplemental applications to run properly. “This is unacceptable in an environment where many of my students don’t have much money and where they must also use the university’s computer pool to access course material, because they don’t own laptops,” she says.

### THE RESULTS

Adopting OWL—for which Victoria was an initial reviewer—has brought welcome change to the teaching of organic chemistry. Victoria likes and uses this product because it is accurate and helps her organize content. “Everything is verified,” she says. “The answers to questions are accurate, which has not been the case with other products I have used. I do not have to recheck the answers provided, which is important to someone as busy as I am. As a result, I really trust OWL and recommend it.”

Like other professors who have used OWL, Victoria is enthusiastic about its ability to provide rapid, comprehensive feedback. As she puts it, “OWL tells students how they are doing, and it guides them immediately to online tutorials, visual exercises, and simulations so they can begin to achieve mastery over the topic. They are also assigned the right number of exercises—not too many and not too few. It is important for us to respect how busy students are, too.”

In bringing together well-organized, accurate content, structured exercises, and rapid feedback, OWL has helped Victoria’s students improve their performance in measurable ways. “When I started teaching here, she says, “the passing grade for this class, historically, was about 68 or 69 percent. When I implemented OWL, it jumped up to about 81 percent.”

Victoria’s students like OWL, too. Her students are motivated, and they appreciate the feedback they receive, because it helps them do better. “They say that it is challenging but fair and that it makes them ‘work like crazy.’ They say that they have never worked so hard for a course but that it makes them successful, and they appreciate that.”

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Source Code: 13L-CH0178



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