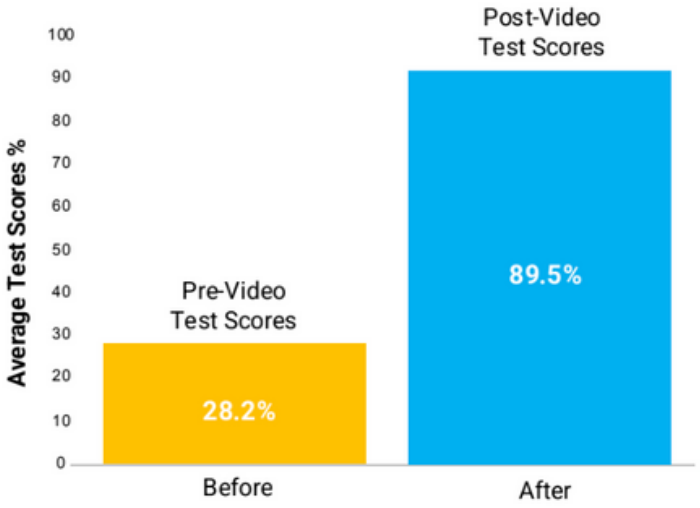
Video Effectiveness in Education

Instructional videos are becoming increasingly common in science courses worldwide, standing as strong competitors to traditional textbooks. But how effective are they as a tool for science education? Peer-reviewed studies prove JoVE's positive impact on student comprehension and learning outcomes.

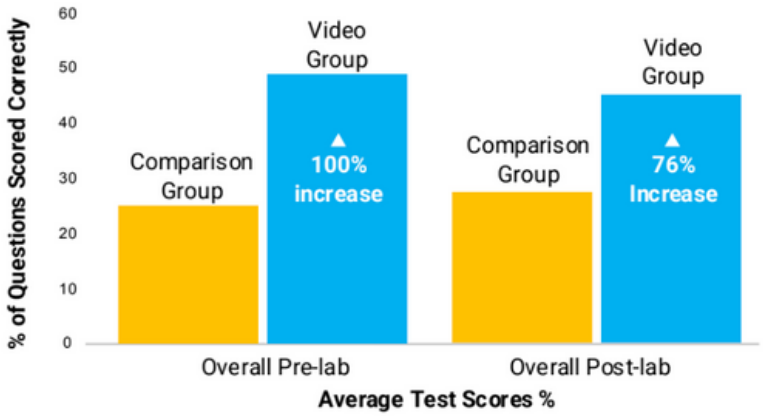
Case Study 1: University of California, Los Angeles [1]

- Over 500 UCLA general chemistry students were taught key concepts such as enthalpy, entropy, rate laws, and Le Châtelier's principle through traditional lectures. They later watched JoVE videos on each of these topics.
- The students completed quizzes on these topics immediately after the lectures and again after watching the videos.



JoVE videos significantly improved students' learning and test performance, with average test scores rising from 28.2% to 89.5%.

Case Study 2: DeSales University and Clemson University [2]



- 94 students at DeSales University and 252 students at Clemson University watched relevant JoVE videos before conducting biology labs on plasmid purification, gel electrophoresis, spectrophotometry, and light microscopy.
- The students' understanding of core concepts and lab techniques was tested both before and after the lab.

Overall, students who watched a JoVE video performed up to 100% better on pre-lab and post-lab assessments compared to those who only read the lab handouts.

1. Ramachandran, R., Sparck, M., & Levis-Fitzgerald, M. (2019). Investigating the Effectiveness of Using Application-Based Science Education Videos in a General Chemistry Lecture Course. Journal of Chemical Education 96(3), 479-485.
2. Mutch-Jones, K., Sengupta, N., Minor, V. C., & Goudsouzian, L. K. (2020). Professional science education videos improve student performance in non major and intermediate biology laboratory courses. Biochemistry and Molecular Biology Education, 1–9.

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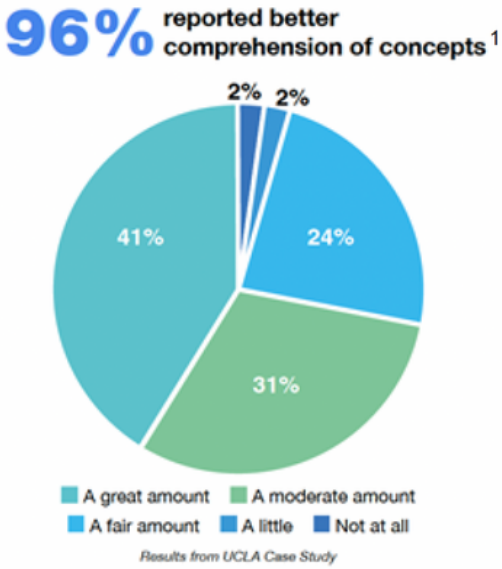
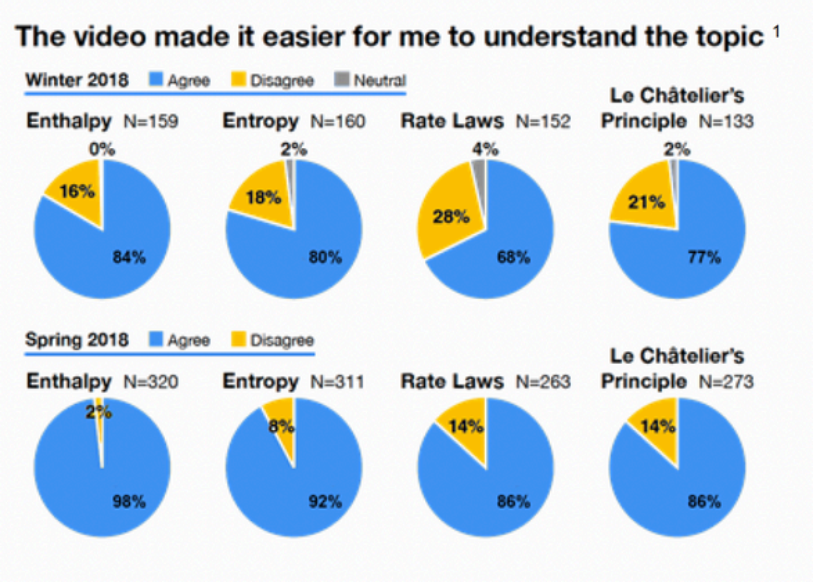
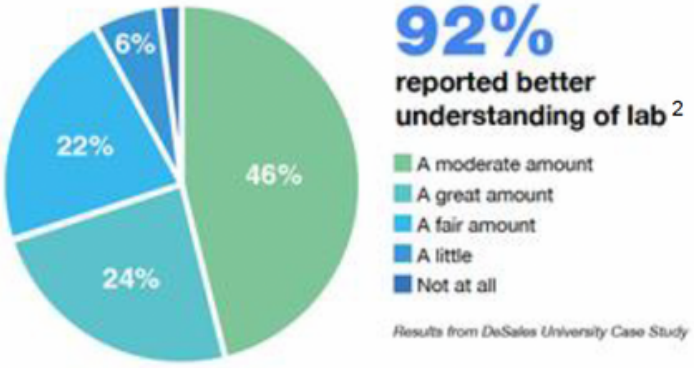
Visualization Improves Concept Comprehension

By incorporating real-world examples, experiments, and engaging animations, JoVE videos enable students to quickly visualize and grasp abstract scientific concepts.



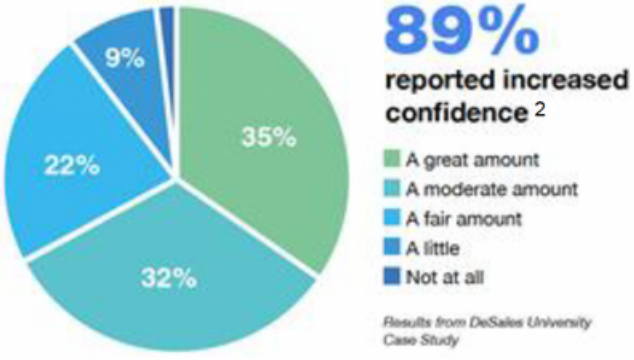


Videos Improve Students' Understanding of Lab Techniques:



In addition to step-by-step demonstrations of lab techniques, JoVE videos explain the theory behind each experiment, helping students connect abstract concepts with real-life applications.

Videos Increase Students' Confidence in the Lab:



When students can visualize an experiment before the lab, their newly gained familiarity with the method boosts their confidence in performing it independently.

1. Ramachandran, R., Sparck, M., & Levis-Fitzgerald, M. (2019). Investigating the Effectiveness of Using Application-Based Science Education Videos in a General Chemistry Lecture Course. Journal of Chemical Education 96(3), 479-485.
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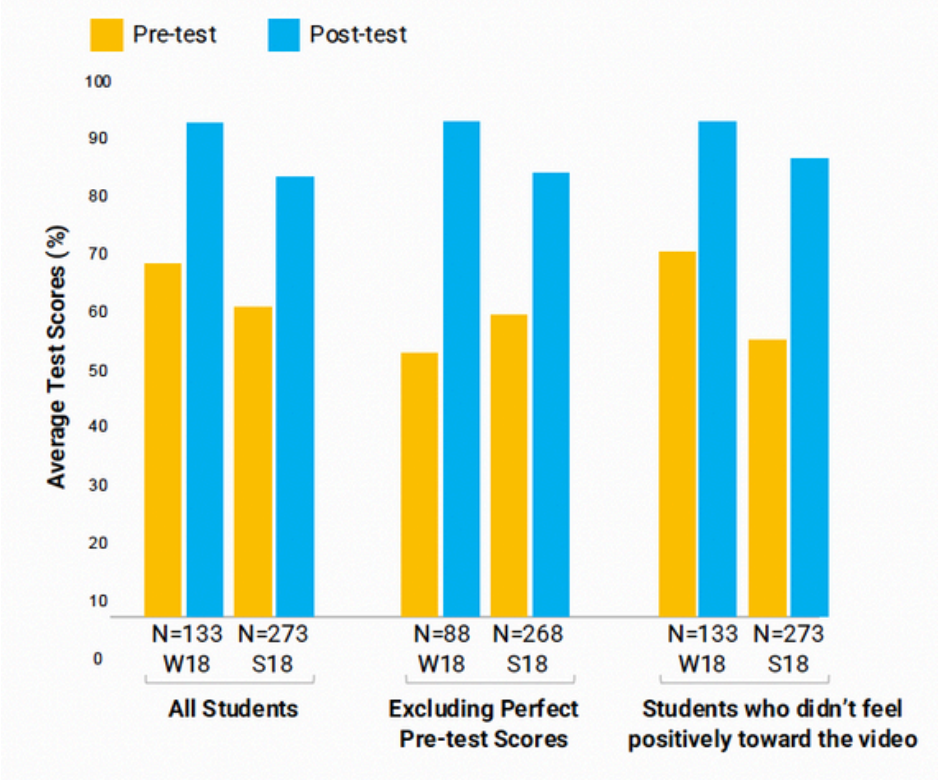
Video Effectiveness in Education

Videos Reinforce Prior Learning

Videos can be watched multiple times, unlike traditional lectures, helping reinforce learning and resolve students' misconceptions. For instance, in the UCLA case study, students who had previously studied Le Châtelier's principle still demonstrated significant learning gains after watching the JoVE video.

Students' Understanding of Le Châtelier's Principle[1]



The graph compares pre-test and post-test quiz scores from Winter 2018 (W18) and Spring 2018 (S18), highlighting student understanding of Le Châtelier's principle. A topic that had been previously covered in an earlier general chemistry course.

The case study demonstrates that integrating JoVE videos into courses significantly enhances student learning and reinforces understanding of key foundational concepts, even among students who initially did not have a positive attitude toward the videos.

Over 2,000 universities and colleges use JoVE to teach science courses both online and on-campus. We are committed to supporting these efforts by continually expanding our library of 21,000+ videos on science concepts and laboratory techniques, covering an increasing range of disciplines. The JoVE Advantage series highlights the effectiveness of JoVE videos in science research and education, along with the benefits they offer.

1. Ramachandran, R., Sparck, M., & Levis-Fitzgerald, M. (2019). Investigating the Effectiveness of Using Application-Based Science Education Videos in a General Chemistry Lecture Course. Journal of Chemical Education 96(3), 479-485.
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