

# Virtual Labs: Exploring New Boundaries in Teaching Biology

**Chris Conner**

([conner@labster.com](mailto:conner@labster.com))

Millions of STEM-related jobs go unfilled annually. While opinions differ as to why, data suggest the so-called STEM skills gap is the result of a retention problem. New, immersive learning technologies such as virtual labs can help bridge the gap by engaging students, increasing access, and decreasing costs. In this session, Dr. Colleen Nolan, professor of biology at Shepherd University, and Labster's Kayla Gulizia will walk through the experience of evaluating, implementing and using virtual labs in a biology course. Nolan will share lessons learned, while Gulizia leads a discussion about how virtual labs help bridge the STEM skills-gap by: 1) expanding access and providing flexibility to non-traditional students, 2) digitally practicing techniques and visualizing concepts, and 3) focusing learning on autonomy, mastery and purpose. An online tool will be used to help shape the conversation by allowing participants to ask questions in real time and answer polls.

Learning Outcomes: 1) Assess the needs of the modern student and analyze the shifts necessary to make learning more effective, 2) Uncover research on the effectiveness of virtual labs in an educational setting, and 3) Identify areas where virtual labs can have the most impact on learning and teaching..

**Keywords:** virtual labs, online labs

### **Mission, Review Process & Disclaimer**

The Association for Biology Laboratory Education (ABLE) was founded in 1979 to promote information exchange among university and college educators actively concerned with teaching biology in a laboratory setting. The focus of ABLE is to improve the undergraduate biology laboratory experience by promoting the development and dissemination of interesting, innovative, and reliable laboratory exercises. For more information about ABLE, please visit <http://www.ableweb.org/>.

*Advances in Biology Laboratory Education* is the peer-reviewed publication of the conference of the Association for Biology Laboratory Education. Published articles and extended abstracts are evaluated and selected by a committee prior to presentation at the conference, peer-reviewed by participants at the conference, and edited by members of the ABLE Editorial Board. Published abstracts are evaluated and selected by a committee prior to presentation at the conference.

### **Citing This Article**

Chris Conner. 2022. Virtual Labs: Exploring New Boundaries in Teaching Biology. Article 24 In: Boone E and Thuecks S, eds. *Advances in biology laboratory education*. Volume 42. Publication of the 42nd Conference of the Association for Biology Laboratory Education (ABLE). <https://doi.org/10.37590/able.v42.abs24>

Compilation © 2022 by the Association for Biology Laboratory Education, ISBN 1-890444-17-0. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the copyright owner. ABLE strongly encourages individuals to use the exercises in this volume in their teaching program. If this exercise is used solely at one's own institution with no intent for profit, it is excluded from the preceding copyright restriction, unless otherwise noted on the copyright notice of the individual chapter in this volume. Proper credit to this publication must be included in your laboratory outline for each use; a sample citation is given above.