The Efficacy of Animations in Promoting Student Knowledge of Muscle/Neurophysiology

Kebret T. Kebede and Tony Scinta

Department of Physical Sciences, Nevada State College, 1124 Nevada State Dr, Henderson NV 89002 USA (drkebede@gmail.com)

The objective of this study was to determine the efficacy of animations in promoting student knowledge of Muscle/Neurophysiology. Students (N = 65) in three undergraduate Anatomy & Physiology courses first received instruction in muscle/Neurophysiology using static imagery embedded in PowerPoint lectures. This exercise was followed by a 20-item “pre-animation” test of structures, functions, and relationships within the Sarcomere/Neuron during the process of contraction. In the subsequent class period, all students received instruction in the same principles of muscle/Neurophysiology, only with animations illustrating the movement of ions and sliding of muscle fibers. Finally, students completed a “post-animation” test involving the same 20 questions included on the pre-test. Scores on individual test items were summed to create composite pre-animation and post-animation indexes. A t-test for dependent means revealed a significant difference between the conditions, with improved performance exhibited on post-animation scores (M = 9.05, SD = 3.51) relative to pre-animation scores (M = 7.34, SD = 2.81), t(63) = 4.131, p < .001. Relative to static imagery, the animations may provide students with a better understanding of the mechanisms associated with organ function by illustrating the sequence of procedural steps in an incisive and regulated manner.

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/. Papers published in Tested Studies for Laboratory Teaching: Peer-Reviewed Proceedings of the Conference of the Association for Biology Laboratory Education 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.

Citing This Article


Compilation © 2011 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 proceedings 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.