Dianne L. Anderson, Ph.D.

Biology Department, Point Loma Nazarene University 619.849.2705
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Professional experience:

2005 - present Professor, Biology Department
Director, MA/MS graduate program in General Biology
Point Loma Nazarene University, San Diego, CA

1991 - 2005 Professor, Biology Department
Department chair (January 1997 – June 1998)
San Diego City College, San Diego, CA

Education:

2003 Ph.D. Math and Science Education
University of California, San Diego & San Diego State University, San Diego, CA

1989 M.S. Microbiology
San Diego State University, San Diego, CA

1985 B.S. Biology (magna cum laude)
Northwest Nazarene College, Nampa, ID

Courses taught in current position:

Undergraduate:
- Human Biology & Bioethics
- Organismal Biology (plant portion)
- Applied Plant Biology
- Senior Seminar (Biology Majors)

Graduate:
- History & Philosophy of Science
- Ecology of Plants & Animals (plant portion)
- Physiology of Plants & Animals (plant portion)
- Research Proposal and Pilot Study

Attendance at and participation in invitation-only working conferences:

Vision & Change in Undergraduate Biology Education funded by NSF, HHMI, USDA, and AAAS (Washington, D.C., August 28-30, 2013)
Evolution Education Assessment workshop (Orlando, FL, April 2011)
Conceptual Assessment in Biology III funded by NSF (San Diego, CA, May 2010)
Conceptual Assessment in Biology II funded by NSF (Monterrey, CA, May 2008)

Manuscript under revision:

Anderson, D.L., Evans, P.L. & Hernandez, J. Development and field testing of a new middle school version of the Conceptual Inventory of Natural Selection leads to a revised high school/college version. Submitted to Journal of Research in Science Teaching.

Publications:

Anderson, D.L., Fisher, K.M. & Smith, M.U. (2010). Support for the CINS as a diagnostic conceptual inventory: Response to Nehm and Schonfeld (2008). Journal of Research in Science Teaching, 47(3), 354-357.

Anderson, D.L., Fisher, K.M., & Norman, G.J. (2002). Development and evaluation of the Conceptual Inventory of Natural Selection. Journal of Research in Science Teaching, 39, 953-978. (cited 299 times as of 6-2-14)

Anderson, D.L. & Tsoukas, C.D. (1989) Cholera toxin inhibits resting human T-cell activation via a cAMP- independent pathway. Journal of Immunology, 143(11), 3647-3652.

Unpublished documents:

Anderson, D.L. (2003). Natural selection theory in non-majors biology: Instruction, assessment and conceptual difficulty. Unpublished Dissertation, University of California, San Diego Library, San Diego, CA

Anderson, D.L. (1989). Cholera toxin inhibits resting human T-cell activation via a cAMP-independent pathway. Unpublished Master's thesis, San Diego State University Library, San Diego, CA

Webinar:

Anderson, D. (May 14, 2010). Using the Conceptual Inventory of Natural Selection. Fifth in the 2010 Webinar series offered by the American Institute of Biological Sciences, University of California Museum of Paleontology, National Association of Biology Teachers, and the Introductory Biology Project

Conference Papers with Presentations:

Korb, M., Anderson, D.L., Hagedorn, E., Jensen, M. & Silberglitt, M. (April 2013). A life science concept inventory on genetics/ molecular biology for middle school learners: Assessment development informs teacher pedagogy. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Evans, P. & Anderson, D.L. (April 2013). The Conceptual Inventory of Natural Selection a decade later: Development and pilot testing of a middle school version leads to a revised college/high school version. Paper presented at annual meeting of the National Association for Research in Science Teaching (NARST) 2013, Rio Grande, Puerto Rico, April 6-9, 2013.

Williams, K.S., Fisher, K.F., Anderson, D.L., Smith, M.U., & Lineback, J.E. (2008). Using diagnostic test items to assess conceptual understanding of basic biology ideas: A plan for programmatic assessment. Paper presented at Conceptual Assessment in Biology II, Monterrey, CA, May 2008.

Conference Presentations:

Anderson, D.L. (December 2014), Engaging ways to teach and assess understanding of natural selection: Concept cartoons and the Conceptual Inventory of Natural Selection. Presented at the annual meeting of the California Science Teachers' Association, Long Beach, CA.

Anderson, D.L. (October 2011). How well do your students really understand natural selection? Presented at the annual meeting of the California Science Teachers' Association, Pasadena, CA.

Anderson, D.L. (October 2011). Biology concept cartoons can engage ALL of your students. Presented at the annual meeting of the National Association of Biology Teachers, Anaheim, CA.

Anderson, D.L. (November 2011). Biology concept cartoons can engage ALL of your students. Presented at the annual meeting of the San Diego Science Educator's Association, San Marcos, CA.

Maskiewicz, A. & Anderson, D.L. (October 2009). Get your students thinking and talking about biology. Presented at the annual meeting of the California Science Teachers' Association, Palm Springs, CA.

Anderson, D.L., Hedgecock, M. & Rall, M.A. (October 2008). New biology cartoons based on alternative conception research. Presented at the annual meeting of the California Science Teachers' Association, San Jose, CA.

Anderson, D.L. & Tenenbaum, R. (October 2008). Analogies in biology: wolves in sheep's clothing or great tools? Presented at the annual meeting of the California Science Teachers' Association, San Jose, CA.

Fisher, K. M., Williams, K. S., & Anderson, D. (August 2007). Developing and evaluating the Conceptual Inventory of Natural Selection. Presented at the annual meeting of the Ecological Society of America, San Jose, CA.

Anderson, D.L. (October 2006) Biology diagrams: Teaching, learning and understanding. Presented at the annual meeting of the California Science Teachers' Association, San Francisco, CA.

Williams, K.S., Fisher, K. & D. Anderson. (2005). Developing a diagnostic exam for general biology. Paper presented in Symposium, "Pathways to scientific teaching in ecology education," at the Ecological Society of America 90th Annual Meeting and IX International Congress of Ecology, Montreal, Canada Aug 2005. Published in *Abstracts of Ecological Society of America,* 90th Annual Meeting, p.694.

Anderson, D.L. (October 2005). Promoting conceptual understanding of natural selection using activities to teach ecology and genetics ideas. Presented at the annual meeting of the California Science Teachers' Association, Palm Springs, CA.

Anderson, D.L. & Fisher, K.M. (March 2003). Conceptual Inventory of Natural Selection: A useful classroom tool with instructional implications. Presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Anderson, D.L. & Fisher, K.M. (March 2002). Biology concept cartoons: A constructivist tool for dealing with alternative conceptions. Presented at the annual meeting of the National Science Teachers' Association, San Diego, CA.

Fisher, K., Anderson, D., Becvar, L., Noland, C., Anderson, A., Sandifer, C., & Goessling, C. (May 2000). Evolution as an experimental science: Implications for developing and assessing students' conceptions. Presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.

Master's theses directed:

Jessica Pimetal Spahr (2014). High school students' conceptual understanding of natural selection, specifically variation in a population and origin of variation, as influenced by traditional Concept Cartoons, or an animated software program. Master's thesis, Point Loma Nazarene University, San Diego, CA

Reed, Marilyn (2014). Use of inquiry based-pedagogy during organism dissection to improve scientific questioning skills of middle school students

Vogel, Casey (2013). Scaling ability and atom and cell conceptions and their implications for understanding cellular functions by middle school students. Master's thesis, Point Loma Nazarene University, San Diego, CA.

Evans, Patricia (2013). A Revision of the Conceptual Inventory of Natural Selection for middle school students. Master's thesis, Point Loma Nazarene University, San Diego, CA.

Porter, Christy (2011). Use of biology concept cartoons to promote discussion of mitosis and meiosis among high school biology students: A qualitative study. Master's thesis, Point Loma Nazarene University, San Diego, CA.

Gross, Muriel (2011). Use of biology concept cartoons to assist low performing middle school students in their understanding of natural selection. Master's thesis, Point Loma Nazarene University, San Diego, CA.

Dwyer, Danielle (2011). Using interview data from non-major biology students to improve the Conceptual Inventory of Natural Selection. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Broemmelsiek, Jocelyn (2010). The effects of application-based inquiry curriculum on students' understanding of the nature of science. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Hermosillo, Nina (2010). The validity of a two-tiered diagnostic assessment for identifying college students' ideas about meiosis and mitosis. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Rall, Michael (2009). Design and use of conceptual cartoons as tools for conceptual change in high school biology classes. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Estes, Sarah (2008). Evidence for natural selection conceptions present in upper division biology majors. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Plagge, Anita (2008). The relationship between college students' biology knowledge and support of stem cell research. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Rall, Mary Ann (2008). Using concept cartoons and the Conceptual Inventory of Natural Selection to evaluate the progression of students' understanding of natural selection. Master's Thesis, Point Loma Nazarene University, San Diego, CA.

Awards and Grants

Point Loma Nazarene University Alumni Grant (Spring 2012). Production of research-based biology concept cartoons on the topics of cell division, natural selection, and ecology for use by middle and high school teachers.

Professional Associations:

National Association of Biology Teachers (member)
California Science Teachers' Association (member)
National Association for Research in Science Teaching (member)

Professional service:

Member of organizing committee for Science Faith Alliance sponsored Professional Development Day for Science Teachers at Christian Schools in 2013, 2014 and 2015 in San Diego.

Science Faith Alliance board member since 2010

Member of organizing committee and host for the international Conceptual Assessments in Biology Meeting (CAB III) in May 2010 at Point Loma Nazarene University

Manuscript reviewer for the following journals:

Bioscience
CBE – Life Sciences Education
International Journal of Science Education
Journal of Research in Science Teaching