

## **CRAIG E. NELSON**

Professor Emeritus of Biology, Indiana University [at I.U. since 1966; Emeritus since 2004]

**Degrees:** Ph.D. & M.A. ('66, '64) University of Texas; B.A. With Honours ('62) University of Kansas

**Address:** Jordan Hall 142, 1001 E. 3rd St. Indiana University, Bloomington, Indiana 47405-7005

**Phone:** 812-855-1345 (IU / messages). **E-Mail:** nelson1@indiana.edu [Note: nelson'one']

### **AWARDS & HONOURS:**

- Tenured and twice promoted at IU with teaching specified as the area of excellence.
- Outstanding Teaching Award, Indiana University Student Alumni Council, 1981
- Indiana University-Lilly Foundation Postdoctoral Teaching Fellowship, 1981- 1982
- Amoco Foundation Award "In Recognition of Distinguished Teaching", 1983
- Outstanding Faculty Award, Indiana University Student Alumni Council, 1987
- Faculty Colloquium on Excellence in Teaching "In Recognition of Distinguished Teaching" 1989
- Chancellor's Lecture on Great Teaching, Vanderbilt University, 1991
- President's Honour for Teaching, Northwestern University, 1994
- Sigma Xi National Lecturer, 1993-95 [For Scholarship on Teaching]
- Scholarship of Teaching and Learning Presentation Award, IU, 1999
- *Carnegie Scholar* for 2000-2001, Carnegie Foundation for the Advancement of Teaching
- *Outstanding Research And Doctoral University Professor Of The Year, 2000*, Carnegie Foundation for the Advancement of Teaching / Council for the Advancement and Support of Education (CASE)
- *President's Medal for Excellence*, Indiana Univ., 2001 ["The highest honour bestowed by Indiana U."]

**TEACHING:** Dr. Nelson's tenure and promotions cited excellence in teaching, an unusual accomplishment at a research university. He received several IU and nationally competitive teaching awards (above). He taught: introductory biology; graduate and undergraduate evolution and ecology; an Intensive Freshman Seminar (Biology, Critical thinking and Real Life) and several interdisciplinary and honours courses (e.g. Environmental Science and Policy, Ideas and Human Experience, the History of Everything Except Civilization), and part of a three course liberal-arts cluster (Knowing, Knowledge and Their Limits: Literature, Psychology, and Biology). He regularly taught a graduate biology course on "Alternative Approaches to Teaching College Biology." Dr. Nelson was one of IU's teachers featured in the videotapes, *Making Larger Classes Work: Experiences of Indiana University Faculty* and *What to Expect in the College Classroom* [produced & distributed by IU 812-855-1983].

**ADMINISTRATION:** Dr. Nelson directed the Graduate Programs in Zoology (1981-83) and in Ecology, Evolution and Organismal Biology (1984-87). He was the first Director (1971-77) of Environmental Programs in IU's then new School of Public and Environmental Affairs. Its interdisciplinary environmental programs (B.A. to Ph.D.) now rank among the best worldwide. (See: C. Nelson, 1974. "Environmental Studies Programmes, Indiana University." Pp. 97-110 in: *Environmental Education at Post Secondary Level*, Centre for Educational Research and Innovation (CERI/OECD), Paris (Reprinted: pp. 79-88 in A.L. Pratt (Ed.), 1974, *Selected Environmental Education Programs in North American Higher Education*, National Association for Environmental Education).

## **BIOLOGICAL RESEARCH:**

Dr. Nelson's biological research is in evolution and ecology. Research questions have included: Do tadpoles die for their siblings? Do amphibians feed or exploit ponds? When, from a male frog's viewpoint, is stealing a mate preferable to persuasion? Why should an orchid scare its pollinators? And: Why should hot eggs become females in turtles? He has done extensive field work in Latin America. *Selected Biological Publications* (from 70+ scientific papers):

Freedberg, S., R.M. Bowden, M.A. Ewert, D.R. Sengelaub and C.E. Nelson. 2006. Long-term sex reversal by oestradiol in amniotes with heteromorphic sex chromosomes. *Biology Letters*. Online. Doi:10.1098/rsbl.206.0454 4pp.

Freedberg, S., M.A. Ewert, B.J. Ridenhour, M. Neiman, C.E. Nelson. 2005. Nesting fidelity and molecular evidence for natal homing in the freshwater turtle, *Graptemys kohni*. *Proceedings of the Royal Society B: Biological Sciences* 272:1345-1350.

Ewert, M.A., Lang, J.W., and Nelson, C.E. 2005. Geographic variation in the pattern of temperature-dependent sex determination in the American snapping turtle (*Chelydra serpentina*). *Journal of Zoology* London 265:81-95.

Freedberg, S., A.L. Stumpf, M.A. Ewert, C.E. Nelson. 2004. Developmental environment has long-lasting effects on behavioural performance in two turtles with environmental sex determination. *Evolutionary Ecology Research* 6:739-747.

Ewert, M.A., Etchberger, C.R., and Nelson, C.E. 2004. Turtle sex determining modes and TSD Patterns, and some TSD pattern correlates. Chapter 3 (pp 21-32). In: Valenzuela, N. and V. Lance, Eds. *Temperature Dependent Sex Determination in Vertebrates*. Smithsonian Books. Washington D.C.

Ewert, M.A. and C.E. Nelson. 2003. Metabolic heating of embryos and sex determination in the American Alligator, *Alligator mississippiensis*. *Journal of Thermal Biology* 28:159-165.

Bowden, R.M., M.A. Ewert and C.E. Nelson. 2002. Hormone levels in yolk decline throughout development in the red-eared slider turtle (*Trachemys scripta elegans*). *General and Comparative Endocrinology* 129:171-177.

Etchberger, C.R., M.A. Ewert, J.B. Phillips and C.E. Nelson. 2002. Carbon dioxide influences environmental sex determination in two species of turtles. *Amphibia-Reptilia* 23 (2): 169-175

Freedberg, S., M.A. Ewert and C.E. Nelson. 2002. Environmental effects on fitness and consequences for sex allocation in a reptile with environmental sex determination. *Evolutionary Ecology Research* 3:953-967.

Clark, P.J., M.A. Ewert and C.E. Nelson. 2001. Physical apertures as constraints on egg size and shape in the common musk turtle (*Sternotherus odoratus*). *Journal of Functional Ecology* 15:70-77.

Klukowski, M. & C.E. Nelson. 2001. Ectoparasite loads in free-ranging northern fence lizards, *Sceloporus undulatus hyacinthinus*: Effects of testosterone and sex. *Behavioral Ecology & Sociobiology* 49:289-295.

Bowden, R.M., Ewert, M.A., and Nelson, C.E. 2000. Environmental sex determination in a reptile varies seasonally and with yolk hormones. *Proceedings Royal Society London*. B 267:1454-1459

Klukowski, M. and C.E. Nelson. 1998. The challenge hypothesis and seasonal changes in aggression and steroids in male northern fence lizards, *Sceloporus undulatus hyacinthinus*. *Hormones and Behaviour* 33:197-204.

Klukowski, M., N.M. Jenkinson and C.E. Nelson. 1998. Effects of testosterone on locomotory performance and growth in field active northern fence lizards, *Sceloporus undulatus hyacinthinus*. *Physiological Zoology* 71: 506-514

Ewert, M.A., D.R. Jackson and C.E. Nelson. 1994. Patterns of Temperature-Dependent Sex Determination in Turtles. *Journal of Experimental Zoology* 270:3-15.

Viets, B.E., M.A. Ewert, L.G. Talent and C.E. Nelson. 1994. Sex-Determining Mechanisms in Squamate Reptiles. *Journal of Experimental Zoology* 270:45-46.

Ewert, M.A. and C.E. Nelson. 1991. Sex Determination In Turtles: Diverse Patterns And Some Possible Adaptive Values. *Copeia* 1991: 50-69.

Heyer, W., A. Rand, C. Goncalves da Cruz, O. Peixoto, and C.E. Nelson. 1990. *Frogs of Boraceia*. *Arquivos de Zoologia*, Univ. Sao Paulo, (Brasil) 31(4):231-410

Romero, G.A. and C.E. Nelson. 1986. Forcible Pollen Emplacement And Male Flower Competition Sustain Sexual Dimorphism in *Catasetum* Orchids. *Science* 232:1538-1540.

## **SCHOLARSHIP OF TEACHING AND LEARNING**

Dr. Nelson is Professor Emeritus of Biology at Indiana University where he has been since 1966. Dr. Nelson's Scholarship of Teaching and Learning focuses on the scholarships of synthesis and application (per Boyer and Rice). When Dr. Nelson began his work in this area, it was clear that the empirical and theoretical base for much improved college teaching was well already in hand. The major effort needed was in developing ways to apply this base in the classroom. Dr. Nelson has worked to develop such applications and to help other faculty understand the empirical and theoretical base, the most feasible ways to apply it, and the importance of doing both. Dr. Nelson was part of the committee that founded the prestigious Scholarship of Teaching and Learning program at IU (see [www.indiana.edu/~sotl/](http://www.indiana.edu/~sotl/) and articles by S. Thompson and by Robinson and Nelson in the SOTL special issue of the Journal of Excellence in College Teaching, vol. 14). This program won the prestigious Hesburgh Award for outstanding faculty development in 2003 (see [newsinfo.iu.edu/news/page/normal/777.html](http://newsinfo.iu.edu/news/page/normal/777.html)). He chaired (2004-05) the founding committee for the new *International Society for the Scholarship of Teaching and Learning* (<http://www.issotl.org/>), became its first president and still serves on its board. He currently serves on the editorial boards of key journals for the scholarship of teaching and learning (SOTL): *International Journal for the Scholarship of Teaching & Learning* (<http://www.georgiasouthern.edu/ijstotl/>) *JoSoTL* (<http://www.iupui.edu/~josotl/>) and *MountainRise* (<http://mountainrise.wcu.edu/>). He has served on the editorial board of *The Journal for Excellence In College Teaching* and of *The Journal of Cooperation and Collaboration in College Teaching*, on the editorial panel of *College Teaching* and on teaching grant review panels for NSF, NEH and FIPSE. He has been a Carnegie Scholar (Carnegie Academy for the Scholarship of Teaching) since 2001. He was named **Outstanding Research And Doctoral University Professor Of The Year, 2000** by the Carnegie Foundation for the Advancement of Teaching and the Council for the Advancement and Support of Education (CASE) and received IU's **President's Medal for Excellence** ["The highest honour bestowed by Indiana Univ."] in 2001.

### **1. FOSTERING CRITICAL THINKING & MATURE VALUING ACROSS THE CURRICULUM**

Nelson, C.E. 1999. On the persistence of unicorns: The trade-off between content and critical thinking revisited. In B.A. Pescosolido and R. Aminzade, Eds., *The Social Worlds of Higher Education: Handbook for Teaching in a New Century*. Pine Forge Press. [http://mypage.iu.edu/~nelson1/99\\_PersistenceUnic.pdf](http://mypage.iu.edu/~nelson1/99_PersistenceUnic.pdf)

Nelson, C.E. 1989. Skewered on the unicorn's horn: The illusion of a tragic trade-off between content and critical thinking in the teaching of science. In L. Crowe, Ed., *Enhancing Critical Thinking in The Sciences*. Society of College Science Teachers.

### **2. DIVERSITY AND COLLEGE TEACHING.**

Nelson, C.E. 1996. Student Diversity Requires Different Approaches to College Teaching, Even in Math and Science. *American Behavioural Scientist* 40:165-175. [Ideas apply across the curriculum.] [http://mypage.iu.edu/~nelson1/96\\_StudentDiversity.pdf](http://mypage.iu.edu/~nelson1/96_StudentDiversity.pdf)

Nelson, C.E. 1994. Every course differently: an outline *and* (with others) valuing diversity in the educational process. In J. Lanier & W. Sibley, Eds., *Role of Faculty from Science Disciplines in the Undergraduate Education of Science and Mathematics Teachers*. National Science Foundation, Publication 93-108.

### **3. ACTIVE LEARNING**

Ingram, E.L. and C.E. Nelson. 2005. Discussing multiple-choice questions helps students reconstruct their understanding. *American Biology Teacher* May 2005:289-295.

Nelson, C.E. 1997. Tools for tampering with teaching's taboos. Chapter 4 (pp. 51-77) In W.E. Campbell & K.A. Smith, Eds. *New Paradigms for College Teaching*. Interaction Book Co. [http://mypage.iu.edu/~nelson1/97\\_ToolsTamper.pdf](http://mypage.iu.edu/~nelson1/97_ToolsTamper.pdf)

Nelson, C.E. 1994. Critical thinking and collaborative learning. Chapter 5 (pp. 45-58) In K. Bosworth & S. Hamilton, Eds., *Collaborative Learning and College Teaching*. Jossey-Bass. [Abstract by V. Gala posted as #173 on Stanford's Tomorrow's Professor Listserve. <http://sll.stanford.edu/projects/tomprof/newtomprof/postings/173.html>

Nelson, C.E. 1994. Continuous Assessment. Pg. 24 In: E. Bender et al. (Eds.) *Quick Hits, Successful Strategies By Award Winning Teachers*. Indiana University Press. (Invited contribution.)

Nelson, C.E. 1994. [Comments on teaching, with classroom videos and student comments] In: *Making Large Classes: Experiences of Indiana University Faculty*. Videotape. [Produced at IU and distributed by: Instructional Support Services, Dean of Faculties Office, Indiana University].

#### 4. TEACHING EVOLUTION AND THE NATURE OF SCIENCE.

Nelson, C.E. 2006. Nelson's Response to Black. *BioScience* 56:286. [Comment on how to teach evolution so as to reach college students who initially reject it.]

Ingram, E.L. and C.E. Nelson. 2005. Relationship between achievement and students' acceptance of evolution or creation in an upper-level evolution course. *Journal of Research in Science Teaching* 43:7-24.  
[http://mypage.iu.edu/~nelson1/05\\_Ing\\_&\\_N\\_Relationship.pdf](http://mypage.iu.edu/~nelson1/05_Ing_&_N_Relationship.pdf)

Nelson, C.E. 2005. How Can We Help Students Really Understand Evolution? *BioScience* 55:923.  
[http://www.aibs.org/bioscience-editorials/editorial\\_2005\\_11.html](http://www.aibs.org/bioscience-editorials/editorial_2005_11.html) See also: Nelson's Response...*BioScience* 56:286

Nickels, M.N. and C.E. Nelson. 2005. Beware of nuts and bolts: Putting evolution back into the teaching of classification. *American Biology Teacher* 67:289-295. [http://mypage.iu.edu/~nelson1/05\\_Nic\\_&\\_N\\_NutsBolts.pdf](http://mypage.iu.edu/~nelson1/05_Nic_&_N_NutsBolts.pdf)

Nelson, C.E. 2005. Design Isn't science: Why biology classes shouldn't teach intelligent design. [Invited column.] *Fort Wayne Journal Gazette* Perspective page, Sunday, Aug. 28, 2005. [http://www.indiana.edu/~ensiweb/craig\\_id.html](http://www.indiana.edu/~ensiweb/craig_id.html)

Alters, B.J. and C.E. Nelson. 2002. Teaching evolution in college. *Evolution* 56:1891-1901.  
[http://mypage.iu.edu/~nelson1/02\\_A&NTchnEvHiEd.pdf](http://mypage.iu.edu/~nelson1/02_A&NTchnEvHiEd.pdf)

Nelson, C.E. 2002. Creationism. Pp. 214-217 in M. Pagel (Ed.), *Oxford Encyclopedia of Evolution*. Oxford University Press.

Nelson, C.E. and M. K. Nickels. 2001. Using humans as a central example in teaching undergraduate biology labs. *Tested Studies for Laboratory Teaching* 22:332-365. Association for Biology Laboratory Education.  
[http://mypage.iu.edu/~nelson1/01\\_N&N\\_UsingHumans.pdf](http://mypage.iu.edu/~nelson1/01_N&N_UsingHumans.pdf)

Nelson, C.E. 2000. Effective strategies for teaching evolution and other controversial subjects. Pp 19- 50 in: *The Creation Controversy and the Science Classroom*. National Science Teachers Association.  
[http://mypage.iu.edu/~nelson1/00\\_EffStrategiesEv.pdf](http://mypage.iu.edu/~nelson1/00_EffStrategiesEv.pdf)

Nelson, C.E., M.K. Nickels and Jean Beard. 1998. The nature of science as a foundation for teaching science: Evolution as a case study. Chapter 20 (pp. 315-328) in: W.F. McComas, Ed. *The Nature of Science in Science Education*. Kluwer Academic Publ. [http://mypage.iu.edu/~nelson1/98\\_NNB\\_NOS\\_CaseSt.pdf](http://mypage.iu.edu/~nelson1/98_NNB_NOS_CaseSt.pdf)

Nickels, M.N., C.E. Nelson, and J. Beard. 1996. Better biology teaching by emphasizing evolution and the nature of science. *American Biology Teacher* 58: 332-336. <http://www.indiana.edu/~ensiweb/abt.mcj.html>

Nelson, C.E. 1986. "Creation, evolution, or both? A multiple model approach." Ch. 9 In R.W. Hanson, Ed., *Science and creation: geological, theological, and educational perspectives*. Macmillian.  
[http://mypage.iu.edu/~nelson1/86\\_SciCreat.pdf](http://mypage.iu.edu/~nelson1/86_SciCreat.pdf)

Dr. Nelson cosponsors the ***Evolution and Nature of Science Web-site***, which provides teacher-tested lessons and other resources for high-school and college teachers. <http://www.indiana.edu/~ensiweb/>

#### 5. THE SCHOLARSHIP OF TEACHING AND LEARNING (SOTL): PROGRAMS & GENRES

Nelson, C.E. & J.M. Robinson. 2006. The Scholarship of Teaching and Learning and Change in Higher Education." Ch.7 (pp 78-90) In Lynne Hunt, Adrian Bromage, and Bland Tomkinson. Editors. *Realities of Educational Change: Interventions to Promote Learning and Teaching in Higher Education*. London: Routledge. ✓

Nelson, C.E. 2006. Celebration and Reflection. [Invited Essay on SoTL] *MountainRise* 3(1):  
<http://mountainrise.wcu.edu/issue.html>

Nelson, C.E. 2004. Doing It: Selected Examples of Several of the Different Genres of SOTL. *Journal of Excellence in College Teaching*. 14 (2-3): 85-94. [http://mypage.iu.edu/~nelson1/00\\_Genres.pdf](http://mypage.iu.edu/~nelson1/00_Genres.pdf)

Robinson, J.R. & C.E. Nelson. 2004. Institutionalizing and diversifying a vision of the scholarship of teaching and learning. *Journal of Excellence in College Teaching*. 14 (2-3): 95-118.  
[http://mypage.iu.edu/~nelson1/04\\_R\\_&\\_N\\_InstitutionalizingSOTL.pdf](http://mypage.iu.edu/~nelson1/04_R_&_N_InstitutionalizingSOTL.pdf) [See also: Thompson, S. B. 2004. From two box lunches to buffets: Fulfilling the promise of the scholarship of teaching and learning. *Journal on Excellence in College Teaching*. 14 (2-3): 85-94. [http://mypage.iu.edu/~nelson1/04\\_Thompson\\_BoxLs.pdf](http://mypage.iu.edu/~nelson1/04_Thompson_BoxLs.pdf) These two articles

together summarize the genesis and development of the strong SOTL program at Indiana University in Bloomington.]

Nelson, C.E. 2004. The research-teaching-research cycle: One biologist's experience. Chapter 6 (pp.128-141) in M.L. Andrews and W.A. Becaker (eds.) *The Scholarship of Teaching and Learning in Higher Education: Contributions of Research Universities*. Indiana University Press.

Nelson, C.E. 2000. "How Could I Do Scholarship Of Teaching & Learning?: Selected Examples of Several of the Different Genres of SOTL." 3 pp. On CD accompanying: P. Hutchings (Ed.) *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. Carnegie Foundation for the Advancement of Teaching. [Updated Version: [http://mypage.iu.edu/~nelson1/00\\_Genres.pdf](http://mypage.iu.edu/~nelson1/00_Genres.pdf)]

Nelson, C.E. 1974. Environmental Studies Programmes, Indiana University. In *Environmental Education at Post Secondary Level* (2 vols.), pp. 97-110. Centre for Educational Research and Innovation (CERI), Organization for Economic Cooperation and Development (OECD), Paris

[Nelson, C.E. 1974. Environmental Studies Program (at Indiana University). In *Selected Environmental Education Programs in North American Higher Education*, A.L. Pratt (Ed.), pp. 79-88. National Association for Environmental Education (Reprint of preceding article)]

## **6. PREPARING FUTURE FACULTY FOR TEACHING**

Nelson, C.E. 1987. Biology program encourages more thoughtful teaching techniques. Campus Report (IU-B) 11(8):4-5 (Invited article) (Available from ERIC, summarized in Resources in Education, Jan. 1988)

## **7. QUICK SUMMARIES OF KEY IDEAS**

Nelson, C.E. 2001. "What Is The Most Difficult Step We Must Take To Become Great Teachers?" *National Teaching and Learning Forum* [= *NTLF*]. 10(4): 10-11. [http://mypage.iu.edu/~nelson1/01\\_6\\_MostDifficult.pdf](http://mypage.iu.edu/~nelson1/01_6_MostDifficult.pdf)

Nelson, C.E. 2001. "What Might Help A Pretty Good Teacher Become A Great Teacher?" *NTLF* 10(3): 5-7 [http://mypage.iu.edu/~nelson1/01\\_5\\_HelpPrettyGood.pdf](http://mypage.iu.edu/~nelson1/01_5_HelpPrettyGood.pdf)

Nelson, C.E. 2001. "Why Should You Publish Your Best Teaching Ideas?" *NTLF* 10(2):10-11. [http://mypage.iu.edu/~nelson1/01\\_4\\_WhyPublish.pdf](http://mypage.iu.edu/~nelson1/01_4_WhyPublish.pdf)

Nelson, C.E. 2000. "What Is The First Step We Should Take To Become Great Teachers?" *NTLF* 10(1):7-8. [http://mypage.iu.edu/~nelson1/00\\_3\\_FirstStep.pdf](http://mypage.iu.edu/~nelson1/00_3_FirstStep.pdf)

Nelson, C.E. 2000. "Must Faculty Teach in Ways That Make Them Easily Dispensable?" *NTLF* 9(6):4-5. [http://mypage.iu.edu/~nelson1/00\\_2\\_MustFacTch.pdf](http://mypage.iu.edu/~nelson1/00_2_MustFacTch.pdf)

Nelson, C.E. 2000. "How Can Students Who Are Reasonably Bright And Who Are Trying Hard To Do The Work Still Flunk?" *NTLF* 9(5):7-8. [http://mypage.iu.edu/~nelson1/00\\_1\\_HowCanSsFlunk.pdf](http://mypage.iu.edu/~nelson1/00_1_HowCanSsFlunk.pdf)