

Ronald Joseph MacDonald (PhD)

Faculty of Education
University of Prince Edward Island
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EDUCATION

- PhD. University of South Australia, 2006
- Masters of Education St. Francis Xavier University/OISE, 2000
- Bachelor of Education (Secondary Science), St. Francis Xavier University, 1990
- Bachelor Science in Biology, minor in Math and Chemistry from University College of Cape Breton/St. Francis Xavier University, 1988

EMPLOYMENT HISTORY

- Assistant Professor, Faculty of Education, University of Prince Edward Island, 2006 - present
- Senior Lecture, Faculty of Education, University of Prince Edward Island, 2005 - 2006
- Sessional Instructor, Cape Breton University and Memorial University of Newfoundland, 1998 - 2004
- Secondary School Teacher, Cape Breton Victoria Regional School Board, 1998 - 2005
- Secondary School Teacher, Metropolitan Separate School Board, Toronto, Ontario, 1997 - 1998
- Secondary School Teacher, Cape Breton Victoria Regional School Board, 1997 - 1991
- Secondary School Teacher, Metropolitan Separate School Board, Toronto, Ontario, 1990 - 1991

AREAS OF EXPERTISE

- Science Methods Instruction for Pre-service Teachers
- Technology Integration Methods for Pre-service Teachers
- Science Teacher Professional Development
- Teacher Education
- Information Communication Technology Teacher Professional Development
- Science Instruction in K-12
- Technology Integration in K-12
- Graduate Level Information Communication Technology Integration
- Graduate Level Quantitative and Qualitative Research Methods
- Data Logger Integration in Secondary Science
- Ethics in Educational Research

RECORD OF TEACHING

University of Prince Edward Island

School Year 2008-2009

Bachelor of Education:

- ED444M: Middle Years Science Methods
- ED446SI: Senior Years Science Methods (I)
- ED446SII: Senior Years Science Methods (II)
- ED474: Information Technology Integration

Graduate Courses:

- ED616: Action Research in Education

School Year 2007-2008

Bachelor of Education:

- ED446S: Senior Years Science Methods (I)
- ED447S: Senior Years Science Methods (II)
- ED444M: Middle Years Science Methods
- ED495: Introduction to Teaching and School Experience (Practicum supervision)
- ED496: General Teaching Methods and School Experience (Practicum supervision)

School Year 2006-2007

Teaching the following Bachelor of Education courses:

- ED444M: Middle Years Science Methods
- ED446SI: Senior Years Science Methods (I)
- ED446SII: Senior Years Science Methods (II)
- ED497: Issues in Teaching and School Experience

School Year 2005-2006

Taught the following Bachelor of Education courses:

- ED445E: Early Years Science Methods
- ED444M: Middle Years Science Methods
- ED446SI: Senior Years Science Methods (I)
- ED446SII: Senior Years Science Methods (II)
- ED474: Information Technology Integration

Graduate Courses:

- 612: Quantitative Research Methods
- 626: Technology: Leadership in Learning

Cape Breton University/Memorial University of Newfoundland

School Year 2001- 2004

Graduate Courses:

Course Designer and Instructor for Cape Breton University/Memorial University of Newfoundland Master of Education (Information Technology) distance education courses:

1. Integration of Instructional Design and Information Technology
2. Software Review and Selection.

Note: each of these two courses were taught once over the three years (**total= 6**)

School Year 1998-2000

Graduate Courses:

Course Designer and Instructor for Cape Breton University distance education course -
Software Application and Curriculum Integration

Note: this course was taught once over the two years (**total = 2**)

School Year 1998-1999

Computer In-service Instructor for Extension and Community Affairs (Cape Breton
University)

Cape Breton Victoria Regional School Board

School Years 1991-2005

Science: Science 10, Chemistry 11, Chemistry 12, Physics 12, Oceans 11, Agriculture 11,
Biology 10, Biology 12

Math: Grades 7, 8, 9, 10, 11 and 12

Computer Related Studies: Grade 7, 8, 9 and 12

History 10, Co-op Education, Political Science 11, Health: Grade 7, 9

School Year 2001- 2004

Computer System Co-Administrator for *WinSchool* and other management software
applications

School Year 1996-97

Teacher Professional Development Facilitator - Information Technology

Metropolitan Separate School Board, Toronto, Ontario

School Year 1997-98

Taught at Jean Vanier Catholic Secondary School, Scarborough - Grade 12
Physics, Grade 9 Science

School Year 1990-91

Taught at St. Basil-the-Great College School, Toronto - Grade 11 and 13 Biology and
Chemistry.

PROGRAM OF RESEARCH

Graduate Supervision

1. University of Prince Edward Island
Co-supervision: Masters of Education
Student: Barbara MacDonald
Title: Connection to place and visitor experience in Prince Edward Island National Park: A
Mixed Method Study
Date: Continuing
2. University of New Brunswick
Co-supervision: PhD
Student: Elizabeth Costa

I am currently a co-supervisor, with Dr. Douglas Willms and Dr. Elizabeth Sloat, for a University of New Brunswick Doctor of Philosophy candidate who will be completing her degree within the year. This student is engaged in a mixed-method study investigating the effects of advisory groups on student engagement.

Title: The Effects of Advisory Groups on Student Engagement: A Mixed Methods Study
Date: Continuing

3. Memorial University of Newfoundland
Co-supervisor: Masters of Education in Technology
Student: Jonathan Hayes

I am currently a co-supervisor, with Dr. Karen Goodnough, a Memorial University of Newfoundland Master of Education candidate who will be completing his degree within the year. This student is engaged in a mixed-method study investigating the potential differences between teachers' and students' perceived support needs for student inquiry in science.

Title: How do students' and teachers' perceptions of support for student inquiry compare: A Mixed Methods Study
Date: Continuing

Research Funding

- 2008 *New Learners, New Learning @ UPEI*
My Role: Co-investigator with six other researchers
Purpose: This research will contribute to that process by proposing a framework for exploring the needs, interests and skills of learners entering the University of Prince Edward Island for the first time.
Source: UPEI Office of the Vice President Academic
Amount: \$7,819,
- 2008 *Data Logger Integration in Secondary Science: An Investigation of Gender and Student Engagement*
My Role: Principal Investigator
Purpose: This research will investigate possible gender differences in data logger-facilitated physical science education, probe for underlying causes of these potential differences, and find ways to help teachers work with these possible differences.
Source: UPEI Major Research Grant
Amount: \$3,000
- 2007 My role: Present Research findings at the American Educational Research Association Conference in New York
Purpose: Travel Grant Award
Source: UPEI
Amount: \$1,200
- 2007 *Effective teaching in senior high science classrooms through the development of a professional learning community: Part C*
My Role: Principal Investigator
This research seeks to develop a sustainable, teacher-directed, professional development model. The professional development model involves the creation and

maintenance of a community of practice with secondary science teachers. Science probe technology integration, with the ultimate focus on increasing learner-centeredness, will be the vehicle through which this community may develop.

Source: UPEI Strategic Institutional Grant

Amount: \$5,000

2007 My role: Present Research findings at the Canadian Society for Study of Education
Purpose: Travel Grant Award
Source: UPEI
Amount: \$1,300

2006 *Effective Teaching in Senior High Science Classrooms through the Development of a Community of Practice*
My role: Principal Investigator
Purpose: To develop a sustainable, teacher-directed professional development model. The professional development model will involve the creation and maintenance of a community of practice with secondary science teachers. Science probe technology integration, with the ultimate focus on having students regulate their own learning, will be the vehicle through which this community may develop.
Source: Joint Educational Research Group – Prince Edward Island Department of Education Grant Amount: \$4,500

2006 *Effective Teaching in Senior High Science Classrooms through the Development of a Community of Practice*
My role: Principal Investigator
Purpose: To develop a sustainable, teacher-directed professional development model. The professional development model will involve the creation and maintenance of a community of practice with secondary science teachers. Science probe technology integration, with the ultimate focus on having students regulate their own learning, will be the vehicle through which this community developed.
Source: University of Prince Edward Island New Scholar Grant
Amount: \$2,000

2005 Awarded to conduct Doctor of Philosophy Research regarding factors contributing to efficient and effective Information Communication Technology Classroom Integration
My role: Principal Investigator
Source: Cape Breton Victoria Regional School Board
Amount: \$5,700

2004 Professional Development for Information Communication Technology Classroom Integration in Australia
My role: Special Study Leave Recipient
Source: Cape Breton Victoria Regional School Board
Amount: \$5,000

PUBLICATIONS

Papers in refereed journals

MacDonald, R. J. (2009). ICT Integration in math and science: The influence of sub-cultural identity. *Canadian Journal of Education*. Accepted.

MacDonald, R. J. (2009). Supporting learner-centered ICT integration: The influence of collaborative and needs-based professional development. *Journal of Technology and Teacher Education*. In Press.

MacDonald, R. J. (2008). Professional development for information communication technology integration: Identifying and supporting a community of practice through design-based research. *Journal of Research on Technology in Education*, 40(3), 429-445.

MacDonald, R. J., & Larter, A. (2007). A professional learning community in senior high science: Data logging and learner-centeredness. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2007*, 1044-1049.

Papers in refereed conference proceedings:

MacDonald, R. J., & Larter, A. (2009, April). *Data logging in senior high science: Are we disadvantaging females?* Paper accepted for presentation at the National Association for Research in Science Teaching, Garden Grove, CA.

MacDonald, R. J., & Larter, A. (2009, April). *Supporting senior high science data logging integration: The identification and support from outsider communities*. Paper accepted for presentation at the National Association for Research in Science Teaching, Garden Grove, CA.

MacDonald, R.J. (2008, March). *Supporting Science Inquiry and ICT Integration through a Secondary Science Teacher Community of Practice*. Paper presented at the American Educational Research Association, New York. **(Please note: this paper was short-listed for a Technology as an Agent of Change in Teaching and Learning SIG Paper Award)**

MacDonald, R. J., Larter, Angela. (2007, October). *A professional learning community of senior high science teachers: Data logging and learner-centeredness*. Paper presented at E-Learn World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education, Quebec City, Canada.

MacDonald, R. J. Larter, Angela. (2007, October). *The sub-cultural identity of secondary science teachers: Implications for ICT integration and teacher professional development*. Paper presented at the Atlantic Educators Conference, Charlottetown, Prince Edward Island.

MacDonald, R. J. (2007, May). *Information communications technology in secondary science and math: Factors in successful integration*. Paper presented at the Canadian Society for Study of Education, Saskatoon, Saskatchewan.

MacDonald, R. J. & Larter, A. (2007, April). *A senior high science professional learning community: First steps*. Paper presented at UPEI Research Forum, Charlottetown, PE.

MacDonald, R. J. (2006, May). *Technology-facilitated pedagogies in secondary science classrooms*. Paper presented at UPEI Research Forum, Charlottetown, PE.

MacDonald, R. J., (2005, October). *Is it about technology or pedagogy? A comparative look at ICTs in science and math*. Paper presented at the Atlantic Educators Conference, Antigonish, Nova Scotia.

MacDonald, R.J., (2004, November). *What counts as information communication technology integration? A new theoretical framework for levels of technology integration*. Paper presented at the Australian Association for Research in Education Conference, Melbourne, Australia

MacDonald, R.J., (2004, November). *Information communication technology integration: An international perspective*. Paper presented at University of South Australia, Adelaide, Australia.

Book Reviews

MacDonald, R.J. 2009. Policy unplugged: *Dis/connections between technology policy and practices in Canadian schools*. Jenson, J., Rose, C. B., Lewis, B., Smith, R., & Shapson, S. Reviewed in *Canadian Journal of Education*, 31 (1): pages not yet assigned, January, 2009.

Professional Publications

MacDonald, R.J., (2005). Information communication technologies in the science classroom: A quantitative study. *AST Journal* 5(1), Nova Scotia Teacher's Union: Armdale, Nova.

Other Publications/Presentations

MacDonald, R.J. & Hayes, J. (2008, October). *Data logging in senior high physics: A carousel of student inquiry opportunities*. Presentation at the Prince Edward Department of Education Teacher Development Conference. Charlottetown, Prince Edward Island, Canada.

MacDonald, R.J. (2008, June). *Integrating Wikis and Blogs: Pedagogy and Practicality*. Presentation at Holland College, Summerside, Prince Edward Island, Canada.

MacDonald, R. J., & Larter, A. (2008, May). *Engaging adult learners through hands-on technology integration: Learning styles and learning achievement*. Conference Presentation at Advancing Adult Education in Prince Edward Island: A Meeting of the Minds, Holland College, Charlottetown, Prince Edward Island, Canada.

- MacDonald, R.J. (2007, November). *Data logging in senior high physics*. Presentation to the Prince Edward Island Physics Curriculum Group. Charlottetown, Prince Edward Island, Canada.
- MacDonald, R.J & Larter, Angela (2007). *An intervention to meet students' needs in one intermediate school in the Eastern School District*. Research Report to Eastern School District, Prince Edward Island.
- MacDonald, R.J. & Gabriel, Martha. (2007, February). *Creating and maintaining your E-portfolio*. Workshop presentation at the University of Prince Edward Island, Charlottetown.
- MacDonald, R. J. (2006, October) *Data logging integration in junior and senior high schools*. Workshop provided to the Prince Edward Island Teachers Federation. Charlottetown, Prince Edward Island, Canada.
- MacDonald, R. J. (2006). *In what ways do teacher attitude, professional development and leadership affect ICT integration?* Unpublished doctoral dissertation, University of South Australia.
- MacDonald, R.J., (2004, November). *ICTs in the science classroom: A current snapshot*. Presentation at the Atlantic Science Teacher Conference, Halifax, Nova Scotia.
- MacDonald, R.J., (2004, October). *Reality-based ICT use in the high school math classroom*. Presentation at the Cape Breton Victoria Regional School Board High School Mathematics Conference, New Waterford, Nova Scotia.

Manuscripts Submitted for Publication

Book Chapter

- MacDonald, R.J. (2010). Building collaborative in-service/pre-service teacher communities of practice to discover how hand-held data logging technology affects senior high students' learning. In J. Yamamoto, R. Lombard, J. Kush & J. Hertzog (Eds.), *Technology Implementation and Teacher Education: Reflective Models*. Pennsylvania: IGI Global.

Articles

- MacDonald, R.J. (2009). *Differential gender learning preferences: ICT integration in Secondary Science*. Submitted.
- MacDonald, R.J., & Larter, A. (2009). *Communities of Practice in Secondary Science: The reification and legitimization of pre-existing communities of practice*. Submitted.
- MacDonald, R. J. (2009). *Community of practice: A professional development option for learner-centered information communication technology integration*. Submitted.

SERVING THE EDUCATIONAL COMMUNITY

Academic Service

- Member of the 43-member, Canada-wide Research Working Group investigating Teacher Education in Canada.
- Member of the Atlantic Educator Conference organizing committee.
- Peer Reviewer for the *Journal of Research in Science Teaching*, 2008 – present
- Book reviewer for the Canadian Society for Study of Education - *Policy Unplugged: Policy Unplugged: Dis/Connections between Technology Policy and Practices in Canadian Schools*, 2008
- Peer Reviewer for *Canadian Society for Study of Education Conference: Technology and Teacher Education*, 2008 – present
- Peer Reviewer for *Canadian Society for Study of Education Conference: Science Education Researchers Group*, 2007 - present
- Peer Reviewer for *Canadian Society for Study of Education Conference: Canadian Association for Teacher Education*, 2007 – present
- Discussant for the Science Education Research Group at the CSSE (Canadian Society for the Study, 2007
- Member of the University of Prince Edward Island SSHRC Canada Graduate Scholarships Program (CGSP) Adjudication Committee, 2007
- Peer Reviewer for the *Atlantic Educator's Conference*, 2007

University Service

- Member of UPEI's Research Ethics Board, 2008 - present
- Chair of UPEI Faculty of Education Departmental Ethics Committee, 2006 – present
- Member of UPEI's PEI Industry Research Chair Application Review Committee, 2009
- UPEI SSHRC Canada Graduate Scholarships Program Adjudication Committee, 2007
- Member of Robertson Library/Information Technology in Education Committee, 2005 – 2008
- UPEI Provincial Education Job Fair Co-coordinator, 2005 - 2006
- Member of UPEI Faculty of Education Hiring Committee, 2006
- I am a member of the UPEI Faculty of Education Learning Commons Committee
- I am the Faculty of Education's representative on the UPEI Kinesiology Degree Development Committee

Provincial Education Service

- Member of the PEI Department of Education Professional Development Committee, 2005 - present
- Prince Edward Island Educational Leadership Committee, 2007- present
- I am a Provincial Grade 11 Physics Curriculum Committee Member, 2007 - present
- I am a Provincial Grade 12 Physics Curriculum Committee Member, 2008 - present
- I am a member of the Provincial Grade 10 Science IB Curriculum Development Committee, 2008 - present

Other Service

- Participated and was certified (Level 1) in the International Baccalaureate (IB) Training for Physics Teaching
- I lead, along with another faculty member, a discussion group at Holland College to inform instructors of the possibilities, pitfalls and opportunities regarding future Master of Education and Doctoral studies.
- I am a member of a UPEI research group investigating the possibilities of addressing adult learners' needs in the University Context.
- Member of the STAS (Science and Technology and Society) committee, which is a web-based support for K-12 students doing research in science, 2006-present.
- Prince Edward Island Science Fair Steering Committee Member
- Science fair organizer for judge recruiter for the Eastern District Regional Science, 2006 - present
- Science fair organizer for judge recruiter for the Prince Edward Island Provincial Science Fair, 2006 - present
- Judge for the Prince Edward Island Provincial Science Fair, 2006 - present
- Member of the Sanfoni-Aventis Biotech Challenge Committee, 2006 - 2007
- Sanfoni-Aventis Biotech Challenge Judge, 2006 - 2007

CERTIFICATION/MEMBERSHIPS

- Technology as an Agent of Change for Teaching and Learning (AERA Special Interest Group), 2007 – present
- Science Education Research Group (CSSE Special Interest Group), 2006 - present
- Society for Information Technology and Teacher Education, 2006 - present
- Association for the Advancement of Computer in Education, 2007 - present
- Canadian Society for Studies in Education, 2006 - present
- American Educational Research Association, 2006 - present
- International Society for Technology in Education, 2006 - present
- Nova Scotia Teachers' Union 1990 - 2007
- Ontario College of Teachers Certification (Secondary Science, Biology, Computer)
- Atlantic Science Teachers Association, 1994-2004