

Curriculum Vita

Alan R. Buss

College of Education
University of Wyoming

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Education

- Ph.D. University of Wyoming, 1998
Curriculum and Instruction
Dissertation: An Analysis of the Essential Elements and Obstacles to Conducting Successful Educational Collaborative Telecommunications Projects Across Multiple Sites.
- M.A. Brigham Young University, 1993
Teaching and Learning
Thesis: An Investigation of the Questioning Behavior of First, Third and Fifth Grade Students During Hands-On Science Lessons
- B.S. Brigham Young University, 1989
Elementary Education, Cum Laude

Awards and Honors

- 2020 John P. Ellbogen Lifetime Teaching Award
2011 Cap and Gown Chapter of the Mortar Board Top Prof
2005 Outstanding Service to the Teaching Profession, College of Education
2003 Special Achievement in GIS, Environmental Systems Research Institute, Inc.

Professional Experience

- 2020-Present, Director of the School of Teacher Education, University of Wyoming, Laramie, WY.
- 2019, Promotion to Full Professor, University of Wyoming, Laramie, WY.**
- 2017-2018, Academic Writing Fellows, College of Education, University of Wyoming, Laramie, WY.
- 2002- 2010, Department Head, Department of Elementary & Early Childhood Education, College of Education, University of Wyoming, Laramie, WY.
- 2003, Promotion to Associate Professor and Tenure, University of Wyoming, Laramie, WY.
- 1997-2002, Assistant Professor, Department of Elementary & Early Childhood Education, College of Education, University of Wyoming, Laramie, WY
- 1993 – 1995, Public School Teacher, Grade 6, Natrona County School District #1, Casper, WY
- 1989 – 1991, Public School Teacher, Grade 2, Gallup/McKinley County School District, Ramah, NM

Publications

Books/Chapters

- White, D. Y., Leonard, J., Chamberlin, M., & Buss, A. (2019). Supporting Noyce Scholars' Teaching of Mathematics in Rural Elementary Schools. In J. Leonard, J., A. Burrows, & R. Kitchen, R (Eds.). *Recruiting, preparing, and retaining STEM teachers for a global generation* (pp. 133-162). Rotterdam, The Netherlands: Sense Publishers.
- Buss, A. & Gamboa, R. (2017). Teacher transformations in developing computational thinking: Gaming and robotics use in after-school settings. In P. Rich and C. B. Hodges (Eds) *Emerging Research, Practice, and Policy on Computational Thinking* (pp 189-203). Springer International Publishing.
- Hutchison, L., Buss, A., Ellsworth, J., & Persichitte, K. (2010). Soothing Cerberus: The Wyoming odyssey. In L.B. Erickson and N. Wentworth (Eds.) *Tensions of Accreditation* (pp. 213-229). Bingley, UK: Emerald Group Publishing, Ltd.

Refereed Articles

- Shepherd, C., Smith, S., Buss, A., Kvenild, C., Ratcliffe, C. (2021). Adding reach and ownership with paper airplane circuits. *International Journal of Designs for Learning*, 12 (2), 127-136.
- Newton, K., Leonard, J., Buss, A., Wright, C., & Barnes-Johnson, J. (2020). Informal STEM: Learning with robotics and game design in an urban context. *Journal of Research on Technology in Education*, 52 (2), 129-147.
- Shepherd, C., Kvenild, C., Smith, S. & Buss, A. (2017). The Unspace case: Developing a maker movement in a multipurpose, flexible space, library setting. *International Journal of Designs for Learning*, 8 (1) 39-51.
- Leonard, J., Buss, A., Gamboa, R., Mitchell, M., Fashola, O. S., Hubert, T., et al. (2016). Using robotics and game design to enhance children's STEM attitudes and computational thinking skills. *Journal of Science Education and Technology*, 25, 860-876. DOI: 10.1007/s10956-016-9628-2.
- Ritz, L. & Buss, A. (2016). A framework for aligning instructional design strategies with affordances of CAVE immersive virtual reality systems. *Tech Trends*, 60, 549-556.
- Buss, A. & Hutchison, L. (2009). Less is more: Structuring the content of a middle-level mathematics technology course. In Simonson, M. (Ed), 32nd Annual Proceedings: Volume #1, Association for Educational Communications and Technology, Louisville, KY.
- McClurg, P. & Buss, A. (2007). Professional development: Teachers use of GIS to enhance student learning. *Journal of Geography*, 106 (2), 79-87.
- Buss, A., Ledley, T, Dahlman, L. and Meyer, C. (2005). ESIP Federation: Supplying Earth Observation Data to GIS Education. Proceedings of the Fifth Annual Education Users Conference, San Diego, CA. July 2005, ESRI, Redlands, CA.

- Buss, A., McClurg, P., and Dambekalns, L. (2002). An investigation of GIS workshop experiences for successful classroom implementation. Proceedings of the Second Annual Education Users Conference, San Diego, CA, July 2002. ESRI, Redlands, CA.
- Buss, A. (2001). A Delphi study of educational telecollaborative projects: Identifying critical elements and obstacles. *Journal of Educational Computing Research*, 24, 233-246.
- Ellsworth, J. & Buss, A. (2000). Autobiographical stories from preservice elementary mathematics and science students: Implications for K-16 teaching. *School Science and Mathematics*, 100, 355-364.
- Buss, A. & McClurg, P. (2000). Teachers implementing GIS in 5th -12th grade classrooms: An investigation of the necessary staff development experiences and support. Proceedings of the International Conference on Mathematics/Science & Technology, San Diego, CA.
- Buss, A. & Hutchison, L. (1998). Incorporating Legodacta® in teaching problem solving to pre-service elementary and secondary mathematics teachers. Proceedings of the International Conference on Technology in Collegiate Mathematics, New Orleans, LA.

Non-Refereed Publications

- Myers, J. & Buss, A. (2012). Preparing students to address grand challenges through mixed-mode case studies. *In the Trenches*, 2 (4), 4-9.
- Buss, A. & McClurg, P. (1999). Initiating the use of GIS technology in Wyoming public schools through in-service workshops. ERIC document ED 444 838.
- Buss, A. (1998). An analysis of the essential elements and obstacles to conducting successful educational collaborative telecommunications projects across multiple sites (Doctoral dissertation, University of Wyoming, 1998). *Dissertation Abstracts International*, 59, 06A: 1885.

Creative Contributions

- Buss, A. & Summerfield, K. (2015). Exploring Density: A 3D Immersive CAVE Simulation. This simulation is routinely used by the staff of the Shell 3D Visualization Center to showcase the capabilities of the CAVE. In 2017 approximately 70% of the 3000 visitors (**2100**) experienced the Density simulation.

Conference Presentations

International/National Refereed Presentations

- Shepherd, C., & Buss, A. R. (2021, November). From Lesson Repository to Online Journal: Increasing Technology Teaching in Teacher Education. *2021 Association for Educational Communications and Technology*, Chicago and Virtual. Panel Discussion on creation of a new open-source journal for sharing instructional ideas and lesson plans incorporating technology.
- Shepherd, C., Smith, S., & Buss, A. (2020, November). Explore, create, share: Leveraging consumable paper circuits to broaden STEAM participation. *2020 Association for Educational Computing and Technology International Conference*, Online.

- Buss, A., Leonard, J., & Moss-Redman, I. (2020, April). Leveraging teachers' cultural and place-based knowledge to enhance STEM learning. *2020 Annual Conference of the Association for the Advancement of Computing in Education*, Online.
- Houseal, A., Inouye, M., Garramon-Merkle, B., Welsh, K., Buss, A., Tuthill, D., Seeley, J., & Leonard, A. (2020, January). Outreach and inreach: Multi-pronged science education efforts at the University of Wyoming. *Association for Science Teacher Education, 27th Annual International Conference*, San Antonio, TX.
- Verma, G., Burrows, A., Leonard, J., Djonko-Moore, C., & Buss, A. (2020, January). Engaging minoritized students in STEM pathways using aviation and computer modeling. *Association for Science Teacher Education, 27th Annual International Conference*, San Antonio, TX.
- Buss, A., Shepherd, C., & Smith, S. (2019, October). Learning from failure: Growing roses of success. *2019 Association for Educational Computing and Technology International Conference*, Las Vegas, NV.
- Shepherd, C., Smith, S. & Buss, A. (2019, October). TED Inspire! Introduction to Block Programming with Sphero Robotics. *2019 Association for Educational Computing and Technology International Conference*, Las Vegas, NV.
- Buss, A., Moran, P., Swarts, G. & Parfitt, K. (2019, October). Energy as a focal point of democratic discussions and learning. *Annual Conference of the National Network for Educational Renewal*, Fort Collins, CO.
- Buss, A. (2018, October). Developing pre-service elementary teachers' mathematical TPACK through geometry and measurement explorations. *2018 Association for Educational Computing and Technology International Conference*, Kansas City, MO.
- Leonard, J., Buss, A., Burrows, A., & Unertl, A. (2017, April). Pathways to equity in engineering and computer science: Fostering STEM in rural learning environments. *Annual Meeting of the American Educational Research Association*, San Antonio, TX.
- Leonard, J., Buss, A., Unertl, A., & Mitchell, M. (2016, October). Using Robotics and Game Design to Promote Pathways to STEM. *38th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Tuscon, AZ.
- Buss, A. & Ritz., L., & Summerfield, K. (2016, October). A Fantastic Journey: Creating an Immersive 3D CAVE Experience for Middle School Science. *2016 Association for Educational Computing and Technology International Conference*, Las Vegas, NV.
- Sorensen-Irvine, C., Persichitte, K., Leutkehans, L., Buss, A. & Brynteson, K. (2016, October). ESSA and Teacher Education: Time to Panic or Think Creatively?? *2016 Association for Educational Computing and Technology International Conference*, Las Vegas, NV.
- Johnson, J. & Buss, A. (2015, October). Using Robotics and Game Design to Enhance Computational Thinking. *National Council of Teachers of Mathematics*, Atlantic City, NJ.

- Myers, J., Lyford, M., Buss, A. & Houseal, A. (2012, October). Preparing teachers for the future – Redesigning science education via the energy-water-climate nexus MSP project. *2012 Geologic Society of America Annual Meeting and Exposition*, Charlotte, NC.
- Buss, A., Shelhamer C., O’Neill, M., Dodds, J., (2012, July). EdPARC: 17 years of geospatial education. *ESRI Education User Conference*, San Diego, CA.
- Buss, A., & Myers, J. (2011, October). Preparing students to address the grand challenges through mixed mode case studies: I. Gold, South Africa and resource availability. Poster presentation at the *2011 Geologic Society of America Annual Meeting & Exposition*, Minneapolis, MN.
- Myers, J., & Buss, A. (2011, October). Preparing students to address the grand challenges through mixed mode case studies: II. Coal, China and the energy-climate nexus. Poster presentation at the *2011 Geologic Society of America Annual Meeting & Exposition*, Minneapolis, MN.
- Buss, A., Myers, J., Kirkwood, R., & Nelson, J. (2011, May). Using the Wyoming Well Atlas to visualize large-scale spatial and temporal relationships of oil and gas penetrations for siting CO₂ geologic sequestration injection wells. Presentation at the *10th Annual Conference on Carbon Capture and Sequestration*, May 2011, Pittsburgh, PA.
- Lyford, M., Myers, J. & Buss, A. (2010, December). Fostering scientific literacy: Establishing social relevance via the grand challenges. Presentation at the *American Geophysical Union*, Fall Meeting, San Francisco, CA.
- Myers, J., Lyford, M. & Buss, A. (2009). On teaching energy: Preparing students better for their role as citizens. *Eos Trans. AGU*, 90(52), Fall Meeting, San Francisco, CA.
- Buss, A. & Hutchison, L. (2009, October). Less is More: Structuring the Content of a Middle-Level Mathematics Technology Course. Presentation at the *Association for Educational Communications and Technology International Conference*, Louisville, KY.
- Buss, A., Myers, J., & Myers D. (2009, October). The site well catalog: I. A means for managing borehole data for sequestration site characterization, selection and permitting. Poster presentation at the *Geological Society of America Conference*, Portland, OR.
- Myers, J. Buss, A. & Myers, D. (2009, October). The Site well catalog II. Identifying requirements and establishing design criteria. Poster presentation at the *Geological Society of America Conference*, Portland, OR.
- Myers, J., Lyford, M., & Buss, A. (2008, November). Creating a Cross-Campus Dialogue about Scientific Literacy. Presentation at the *Association of American Colleges and Universities conference on Engaging Science, Advancing Learning: General Education, Majors and the New Global Century*. Providence, RI.
- Kinstler, M.J., Ellsworth, J., Buss, A. (2006, October). Using Palm Technology in Upper Elementary/Middle School Classrooms. Presentation at the *School Science and Mathematics Association Annual Conference (SSMA)*, Missoula, MT.

- Buss, A., Ellsworth, J., Sheets, J. (2004, April). Seeking Out Science: Student Perceptions and Memories. Presentation at the *National Science Teachers Association Annual Meeting*, Atlanta, GA.
- Buss, A., Shelhamer, V., Graves, S., Munski, D., & O'Neill, M. (2003, April). A Celebration of GIS/GPS in the Classroom: Teacher Experiences. Presentation at the *National Science Teachers Association Annual Meeting*, Philadelphia, PA.
- Dambekalns, L., Buss, A., & Bell, M. (2003, April) Ordinary to Extraordinary: Mapping the World Through Science and Art. Presentation at the *National Science Teachers Association Annual Meeting*, Philadelphia, PA.
- Buss, A. & McClurg, P. (2001, March). An Investigation of the Necessary Staff Development Experiences and Support 5th-12th Grade Teachers Need to Successfully Implement GIS in the Classroom. Paper presentation at the *National Science Teachers Association Annual Meeting*, St. Louis, MO.
- Buss, A. & McClurg, P. (1999, March). Initiating the Use of GIS Technology in Wyoming Public Schools Through In-Service Workshops. Paper presented at the *National Association for Research in Science Teaching Annual Meeting*, Boston, MA.
- McClurg, P. & Buss, A. (1999, March). Increasing Teacher Confidence and Attitudes Toward Geographic Information Systems (GIS) as Effective Learning Tools. Paper presented at the *National Association for Research in Science Teaching Annual Meeting*, Boston, MA.
- Lerner, H., McClurg, P. & Buss, A. (1998, July). Earthscape: Training Wyoming Teachers in GIS. Paper presented at the *Environmental Systems Research Institute 1998 International User Conference*, San Diego, CA.
- Buss, A., McClurg, P. & Lerner, H. (1998, June). Lessons Learned in Introducing GIS Technology to Teachers. Poster session at the *National Educational Computing Conference Annual Meeting*, San Diego, CA.
- Buss, A. & McClurg, P. (1998, April). An Investigation of Educational Telecollaborative Projects. Paper presented at the *National Association for Research in Science Teaching Annual Meeting*, San Diego, CA.
- McClurg, P. & Buss, A. (1997, June). Land Use, Energy and Human Impacts: Local Change in the Global Village. Paper Presented at *National Educational Computing Conference*, Seattle, WA.

Invited Presentations

- Buss, A. (2017, June). Using Robotics to Develop Elementary Students' Computational Thinking. *2017 Summer Conference: Helping Every Student Succeed: Strategies for Engagement, Deepening Understanding, and Addressing Student Difficulties*, Maine Center for Research in STEM Education, Orono, ME.

National Non-Refereed Presentations

- Buss, A. and Biehl, L. (2005). MultiSpec in K-12 Educational Settings. Invited workshop at the *AmericaView Conference*, Laramie, WY.

Buss, A. (2004, November). ESSIP Federation. Poster session at the *NASA ESE Community Meeting*, Monterey, CA.

Regional/Local Refereed Presentations

Buss, A. & Gamboa, R. (2015, September). Developing computational thinking skills through the use of gaming and robotics. Presentation at the *7th Annual Wyoming Afterschool Alliance State Conference on Afterschool Programs*, Laramie, WY.

Ramsey-Walters, S. & Buss, A. (2014, September). Advancing STEM education with GIS. Presentation at the *Wyoming Math and Science Teacher's Conference*, Casper, WY.

Buss, A. (2013, October). Leveraging GIS to Enhance STEM Education. Presentation at the *Wyoming Math and Science Teacher's Conference*, Casper, WY.

Buss, A. (2003, January). Remote Sensing Possibilities for Teachers in the Classroom. Presentation at the *Wyoming Math and Science Teachers' Workshop*, Casper, WY.

Ellsworth, J. & Buss, A. (2001, August). Elementary Methods Students' Math and Science Autobiographies: Implications for Teaching. Presentation at the *National Council of Teachers of Mathematics Western Regional Conference*, Laramie, WY.

Gribb, W. & Buss, A. (2001, October). Remote Sensing of a Local Area: Use in the Classroom. Presentation at the *Remote Sensing in Wyoming Conference*, Cheyenne, WY.

McClurg, P. & Buss, A. (2000, October). Widgets, Oil Wells and Pioneer Trails: Exploring GIS in the Science Classroom. Presentation at the *Regional Meeting of the National Science Teachers Association*, Boise, ID.

Buss, A. (1999, November). Prairie to Mountain Explorer: A GIS Tool for 5th-12th Grade Classrooms. Presentation at GIS Day, Casper, WY.

Buss, A. & Ellsworth, J. (1999, October). Taking a Closer Look at Pre-Service Elementary Teacher's Attitudes Toward Mathematics. Presentation at the *Wyoming Interdisciplinary Conference*, Cheyenne, WY.

Buss, A. & McClurg, P. (1999, October). GIS: A Powerful Classroom Tool. Presentation at the *Technology Task Force Connections 2 Solutions Conference*, Sheridan, WY.

Buss, A., McClurg, P., Lerner, H. & Gribb, B. (1998, October). Widgets, Oil Wells, and Explorer Trails: Using GIS in Geography, Art, and Science Classrooms. Presentation at the *Wyoming Interdisciplinary Conference*, Thermopolis, WY.

Buss, A. & McClurg, P. (1997, November). Poster session of the use of GIS/Remote Sensing by 6-12 grade students in Wyoming, North and South Dakota, Montana and Idaho, Impact of Climate Variability and Climate Change on the Northern Great Plains Conference sponsored by NASA, Great Falls, ND.

Buss, A. (1997, October). Learning for Conceptual Change. Paper presented at the *Wyoming Interdisciplinary Conference*, Rock Springs, WY.

McClurg, P., Buss, A. & Lerner, H. (1997, October). Many Views of Wyoming: Investigating Wyoming Using Spatial Data. Presentation at the *Wyoming Interdisciplinary Conference*, Rock Springs, WY.

Buss, A. & Smith, M. E. (1996, October). An Investigation of Navigational Problems Encountered on the Internet by Pre-service Teachers. Paper presented at the *Fourteenth Annual Northern Rocky Mountain Education Research Association Conference*, Detroit Lakes, MN.

McClurg, P. & Buss, A. (1996, October). Earth System Science Internet Project: An Investigation of Networked Communities. Paper presented at the *Wyoming Space Grant Symposium*, Laramie, WY.

Regional/Local Invited Presentations

Buss, A. (2013, September). STEM Education Panel Member, *Geospatial Conference of the West*, Laramie, WY.

Buss, A. (2008, October). GIS: If You Didn't Know, It is Getting Into Schools. Featured speaker at the *South West Users Group 2008 High Plains GIS Conference*. Laramie, WY.

Regional/Local Non-Refereed Presentations

Buss, A. (2016). You are My Density: A 3D Immersive Journey at the Molecular Level. *Teaching and Technology Invited Presenter Series*, Laramie, WY.

Buss, A. (2016). Elementary and Middle School Computational Thinking via Extramural Activities. *Mathematics Lost in Transition Institute*. Torrington, WY.

Hutchison, L. & Buss, A. (2011). Problem Solving Through Robotics. *E-volution: Innovations in Learning Environments*. Laramie, WY.

Buss, A. (2007). Remote Sensing Applications in K-12 Education. *Women in Science Conference*. Laramie, WY.

Buss, A. (2006). Overhead Projectors, VCRs, and Other Endangered Species. Invited presentation at the *Ellbogen Center for Teaching and Learning J-Term Professional Development Series*, Laramie, WY.

Ellsworth, J. Buss, A., (2004, October). Teaching Science Through Children's Literature. Presentation at the *Fall School Improvement Conference*, Casper, WY.

Buss, A. & Ellsworth, J. (2004, March). Using TASKSTREAM to Submit and Publish Exemplary Science Lesson Plans. Presentation at the *Spring School Improvement Conference*, Casper, WY.

Buss, A. Ellsworth, J. & Lyford, M. (2003, October). Addressing New State Science and Math Standards around the GLOBE. Presentation at the *Fall School Improvement Conference*, Casper, WY.

Buss, A. Ellsworth, J. & Lyford, M. (2003, March). Using Technology to Address Science and Mathematics Standards. Presentation at the *Spring School Improvement Conference*, Casper, WY.

Buss, A. (2002, November). Cutting Edge Technology in Education. Presentation at the *Wyoming Future Teachers Second Statewide Conference*, Laramie, WY.

Buss, A., Hutchison, L., Ellsworth, P. (2002, September). University of Wyoming Science and Mathematics Resources, Presentation at the *Fall School Improvement Conference*, Casper, WY.

Buss, A., & Shafer, R. (1998, February). Poster Session at the *Wyoming GIS Technology Showcase*, Wyoming Geographic Information Advisory Council, Cheyenne, WY.

McClurg, P., Buss, A., Linde, A., Kempema, E., & Lerner, H. (1997, February). Poster session at the *Wyoming GIS Technology Showcase*, Wyoming Geographic Information Advisory Council, Cheyenne, WY.

Grants and Contracts

Funded (\$5,324,056)

Date	Funding Agency	Title	Role	PIs	Funded
2020	NSF	Deepening College Students' Understanding of Molecular Processes Using Augmented Reality and Integrated Social Learning	Prather, J. Bowman, G. Buss, A.	Co-PI	\$300,000
2018	UW Central Student Technology Committee funding	Using Augmented Reality to Increase Students' Understanding of Fundamental Science Concepts	Co-PI	Alan Buss Jonathan Prather, Grant Bowman	\$12,000
2017	NSF	STRATEGIES: The Bessie Coleman Project - Using Computer Modeling and Flight Simulation to Create STEM Pathways	Senior Personnel Interim PI, Aug. – Dec 2018	Jacqueline Leonard Andrea Burrows Brandon Gellis Richard Kitchen Geeta Verma	\$1,199,984
2017	UW A&S seed	Using augmented reality to increase students' understanding of fundamental STEM concepts	Senior Personnel	Jonathan Prather	\$21,793
2017	Heywood Foundations, UW	Bridging Pre-K-12 and university classrooms using distance technologies	Co-PI	Alan Buss Leslie Rush	\$107,190
2016-2019	UW School of Energy Resources	Wyoming Energy Education Initiative	Year 1 (2016-17) – Senior Personnel Years 2-3 (2017-19) PI	Kate Welsh (Year 1) Alan Buss (Years 2-3)	\$750,000

2013-2016	NSF	Visualization basics: Using gaming to improve computational thinking	Co-PI	Jacqueline Leonard Alan Buss Jerry Hamann Farhad Jafari	\$903,503
2012	Wyoming MSP	Preparing teachers for the future – Redesigning science education via the energy-water-climate nexus	Co-PI	James Myers Mark Lyford Alan Buss Ana Houseal	\$234,886
2010	NASA	Northern Great Plains Center for People and the Environment	My role was the director of the Education PARC, or EdPARC, which involved nine institutions of higher learning in five states (ID, ND, MT, SD, & WY) and worked with teachers throughout the region.	Laguette, S.(PI), Buss, A. (EdPARC Lead)	UW received \$67,982 through University of North Dakota
2009	NASA	Northern Great Plains Center for People and the Environment	EdPARC Director	Laguette, S.(PI), Buss, A. (EdPARC Lead)	UW received \$85,099 through University of North Dakota.
2008	NASA	Northern Great Plains Center for People and the Environment	EdPARC Director	Seielstad, G.; Hanley, R.; Hill, M.; Kirilenko, A.; Laguette, S.; Olsen, D.; Romsdahl, R.; Zhang, X.	UW received \$100,000 through University of North Dakota. (\$1,000,000 total).
2006	NASA	Northern Great Plains Center for People and the Environment	EdPARC Director	Seielstad, G., Dalsted, K., Farwell, S. Gessler, P. Buss, A., Lawrence, R., Queen, L. Rattling-Leaf, J.	UW received \$99,994 through UND of the \$1,000,000 total
2005	NASA	Northern Great Plains Center for People and the Environment	EdPARC Director	Seielstad, G., Dalsted, K., Farwell, S. Gessler, P. Buss, A., Lawrence, R., Queen, L. Rattling-Leaf, J. & Seelan, S	UW received \$99,996 through UND of the \$1,000,000 total
2004	NASA	A Public Access Resource Center (PARC) Empowering the general public to use EOSDIS.: Implementation phase” (PARC) Continuation of grant NAG5-3616	EdPARC Director	Seielstad, G., Dalsted, K., Farwell, S. Gessler, P. Buss, A., Lawrence, R., Queen, L. Rattling-Leaf, J. & Seelan, S	UW received \$61,100 through UND of the \$1,000,000 total
2004	Wyoming Dept. of Education	Enhancing education through technology, Title II D	External Evaluator	Sachse, T., Muir, J., Peterson, C.	\$139,540

2004	SMARTer Kids Foundation	SMARTer Kid PREP Grant	PI	Buss, A	\$3750
2004	UW	Graduate School Recruitment Initiative	Dept. Head	Buss, A., Hutchison, L., & Rios, F	\$1500
2004	UW	Innovative course proposal for Summer session	Instructor, Co-PI	Buss, A. Ellsworth, J	\$4500
2002	NASA	A Public Access Resource Center (PARC) Empowering the general public to use EOSDIS.: Implementation phase” (PARC) Continuation of grant NAG5-3616 ()	EdPARC Director	Seielstad, G., Dalsted, K., Farwell, S. Gessler, P. Buss, A., Lawrence, R., Queen, L. Rattling-Leaf, J. & Seelan, S	UW received \$105,000 through UND of the \$1,000,000 total
2002-2003	NASA	WyomingView	My role was to design and conduct educational activities related to the grant.	Driese, K., Sivanpalai, R., Buss, A.	Education budget of \$5,160 from \$116,300
2001	SMARTer Kids Foundation	SMARTer Kid PREP Grant	PI	Buss, A	\$2098
2000-2004	Wyoming Department of Education	Superintendent’s Coalition for Common Core of Knowledge and Skills- Science.	Science Representative on Common Core board.	Buss, A., & Ellsworth, J.	\$120,000
1999-2002	NASA	Northern Great Plains Regional Earth Science Applications Center Grant No. NAG13-9906 National Aeronautics and Space Administration (RESAC)	Wyoming State Coordinator in March 1 1999-February 28 2002. Buss, A (YR 3 only. Previously McClurg, P.), P.I. and Project Director for 5 state K-12 Education	Seielstad,G., Dalsted, K., Farwell,S., Gessler,P., McClurg, P., Nielsen, G., Perrizo,W., Queen, L.	\$195,599 Yr-1) \$67,199; Yr-2)64,200; Yr-3) 64,200 Through UND from \$1,720,000 total
1999	Eisenhower Grant [Title II FY 00 Competitive Grant]	Interpreting the Earthscape Using Technology Tools. Year three of funding.	Organize and facilitate workshops as part of leadership team.	McClurg, P., Buss, A., Dambekalns, L. & Gribb, B.	\$27,385
1998-2003	NASA	A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS. Phase III: Operations (ESIP).” Grant No. NCC5-310	Wyoming State Coordinator in March 1, 1998- February 28, 2003 P.I. and Project Director for 5 state K-12 Education (Yrs. 4-5 only. Previously McClurg, P.),	Seielstad,G., McClurg, P., Dalsted, K. Farwell,S., Gessler,P., Nielsen, G., Osborne, L., Perrizo,W. , Queen, L	\$279,144 YR-1) \$64,938; YR-2) \$58,246; YR-3) \$55,358; YR-4) \$53,919; YR-5)\$46,859 through UND from \$2,450,000 total
1998	Eisenhower Grant [Title II FY 99 Competitive Grant]	Interpreting the Earthscape Using Technology Tools. Year two of funding.	Organize and facilitate workshops as part of leadership team.	McClurg, P., Gribb, B. & Buss, A	\$29,503
1996-2001	NASA	A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS. Phase III: Implementation” (PARC)	Wyoming State Coordinator in: November 15, 1996 - January 31, 2001	Seielstad,G., Helder D., McClurg, P., Farwell,S. Korol, J., Nielsen, G., Osborne, L.,	\$367,350 YR-1) \$63,450; YR-2) 50,000; YR-3) 98,300; YR-4a) 92,000; YR-4b) 63,600

		Grant No. NAG5-3616		Perrizo, W. Queen, L	Through UND from \$3,750,000 total
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Consulting

Houseal, A. & Buss, A. (2014-2017). Implementing the Next Generation Science Standards in the classroom. Campbell County School District #1.

Aagard, S., Buss, A., Parker, S., & Welch, K. (2011). Assisting in the development of new graduate programs in mathematics and science education. Royal University of Bhutan.

Buss, A. (2011). Using Classroom Response Systems to enhance teaching and learning. Sheridan County School District #2.

Buss, A. (2005-07). Integrating Handhelds and Tablet PCs in Classroom Teaching. Sheridan County School District #2.

Buss, Ellsworth (2004-05). Integrating Probeware into the Science Curriculum. Crook County SD#1.

Buss, A. & Dambekalns, L. (2001) Integrating GIS/GPS Technologies in the Classroom: Tools for Addressing District and State Standards in Science, Geography, Mathematics and Art. Workshop conducted for Education faculty at Southwest Missouri State University, Springfield, MO, January 11-13.

Buss, A. & Ellsworth, J. (1999) Integrating Children's Literature and Mathematics. Workshop conducted for In-service Teachers at Evansville Elementary School, Casper, WY, May 27.

Leadership and Service

National

Reviewer for *Educational Technology Research and Development*, 2017-Present

Reviewer for *Action in Teacher Education*, 2013-Present

Reviewer for *Mathematics Teacher: Learning and Teaching Pre-K-12*, 2018-Present

Grant Proposal Reviewer, National Science Foundation, 2014

Invited Member, GIS Summit, Oct. 2014, Washington DC.

Member, ESRI Education Community Advisory Board, 2014-15

Reviewer for *Journal of Research in Science Teaching*, 1999- 2005

Reviewer for *Journal of Geography*, 2007

Member, Earth Science Information Partners (ESIP) Federation Education Standing Committee
2001- 2011

Textbook Reviewer, Wadsworth Publishing Co., 1999

State/Regional

Wyoming Energy Education Initiative, Project Leader, 2017 - 2019

Director of the Education Public Access Resource Center, a five-state consortium part of the Upper Midwest Aerospace Consortium, 2001- 2012

Co-director of the Wyoming Department of Education Superintendent's Coalition for Common Core of Knowledge and Skills- Science, 2000- 2004

Middle School Standards Committee, 2003- 2005
 GLOBE Wyoming Partnership Director, 2001 - Present
 Member of the Wyoming State Technology Committee, 2002- 2003
 Technology Coordinator for the Regional National Council of Teachers of Mathematics Conference, Laramie, WY, 2001
 Member of the Wyoming State Science Standards Committee, 1998-99, 2003-04

University

Trustees Education Initiative, Governing Board, 2016 - Present
Science Initiative, Leadership Team, 2016 - Present
 Chair of the university Academic Information Technology Committee, 2005-2007
 Chair of the university Mobile Computing Initiative Taskforce, 2006-2008
 Member of the Instructional Technology Manager search committee, 2006-2007
 Member of the university Academic Information Technology Committee, 2001-2005

College and Department

Program Coordinator, Science Education PhD option, 2010 - Present
College of Education Technology Committee, Chair, 2018- Present
 Curriculum Review Task Force, School of Teacher Education, 2018- 2019
 Student Teaching Placement Task Force, 2018- 2019
 New Faculty Mentoring Program, 2018-2020
 College of Education Tenure and Promotion Committee, 2010-12, Chair 2012-15, Committee 2017-2018
 CoE Facilities Planning Committee 2003- 2010
 CoE Accreditation Task Force, 2003-2008
 CoE representative to the Wyoming State Contract Advisory Board (PLC), 2003-2005
 Member of the Mentor Teacher Task Force, School/University Partnership, 1999-2006
 Chair of the College Technology Policy Committee, 2000- 2003
 Co-Chair of CoE Elementary Math/Science Faculty Search Committee, 2000- 2003
 Member of the College Technology Student Fees Committee, 2000- 2003
 Faculty Senator, Elementary/Early Childhood Dept. Representative, 2000-2002
 Committee chair for internal academic petitions regarding elementary science, 1998-2002
 Member of the Wyoming School-University Partnership CTL Operations Council, 1997-2002
 Member of the CTL Operations Council committee for Developing a CTL Guide Book, 1997-98.

Advising

Doctoral Chair/Co-Chair

Name	Grad.	Dissertation Title	Current Employer
Baas, Allison C&I Science Education PhD		Preliminary Exam	
Penders, Jana, PhD		Preliminary Exam	
Ross, Katherine, PhD		Completed coursework	
Bret Sorensen, Instructional Tech. EdD		Passed comprehensive exam, in dissertation phase	
Markley, Leslie Instructional Tech. EdD	2020	<i>Perceptions of Virtual Reality Based Cultural Cues in Heritage Language Speakers</i>	

Walwema, Godfrey, C&I Science Education PhD	2020	<i>An investigation on how the CAVE experience helps preservice teachers to build on their understanding of the concept of density at the microscopic level</i>	
Steinbock, Catherine Higher Education EdD	2019	<i>A Tale of two degrees: Revealing the experiential consequences of dual graduates</i>	Eastern Wyoming Community College
Akpovo, Comlan Igor C&I PhD	2017	<i>Black African males' construction of academic identities</i>	Adjunct-at-large
Cloud, Karen C&I Science Education PhD	2017	<i>Culturally relevant science instruction of K-8 teachers of American Indian children</i>	Minnesota State University - Moorhead
Pontius, Joel, C&I Science Education PhD	2014	<i>Hunting animal(s): An Autoethnographic inquiry into hunting as a source of ecological consciousness</i>	Merry Lea Environmental Learning Center of Goshen College
Newton, Steven, C&I EdD	2012	<i>Comprehension of college-level text with high school students underperforming in literacy</i>	Laramie County School District #1, WY

Masters Chair/Co-Chair

Pederson, Kelli (in progress)

Schick, Amy (2020). MSNS-Science, *Aligning Middle School Science Fair with A Framework for K-12 Science Education*

Leimback, Jennifer (2019). C&I, *Returning to Our Roots: Benefits and Challenges of Using Garden Based Learning (GBL) in the Elementary School*

Thacher, Sarah (2019). MSNS-ENR *Place-related Approaches in Teacher Education: A Review of Literature on Place-related Approaches in Preservice Teacher Education*

dePasquale, Margaret (2018). MSNS-ENR, *The long-term effects on conceptual change and affect for preservice teachers one year after a Cave Automatic Virtual Environment (CAVE) experience.*

Jordan, Hanson (2018) C&I. Alternative Plan B – Three Question Responses

Marvel, Cody (2018). MSNS-Mathematics, *An investigation of middle school students' data analysis performance levels.*

Amen, Molly (2017). MSNS-Science, *Is this more than a field trip? Exploring memories of Teton Science Schools' field education program.* (Co-Chair with Ana Houseal)

Nobel, Alicia, (2017). MSNS-Mathematics, *Braving the mindstorms: Using LEGO robots to strengthen proportional reasoning skills.* (Co-chair with Linda Hutchison)

Yosten, Casey (2017). C&I, *The aspects of effective interventions in helping elementary students progress in literacy and mathematics.*

Argent, Christine (2015). C&I, *Mathematical strategies to support the Common Core State Standards and the Standards of Mathematical Practice.*

Ritz, Leah (2015). MSNS-ENR. *Teaching with CAVE virtual reality systems: Instructional design strategies that promote adequate cognitive load for learners.*

Bell, Maggie (2014). MSNS-Science, *Face-to-Face verbal communication and social skills: The Link to Adolescent Learning.*

- Harrison, Shaleas (2013). MSNS-ENR, *An evaluation of the lasting impacts of CRM in the classroom: A Community-Based Collaboration.*
- Fuller, Sarah (2012). MSNS-Science, *Residential field experience at Mills Spring Ranch: Curriculum and rationale.*
- Smith, Wendy (2012). MSNS-Science, *Developing and integrating Wyoming coal lessons into a high school science curriculum.*
- Eakin, Julie (2011). MSNS-Science, *Developing and implementing an energy curriculum unit to enhance students' understanding of energy and ability to apply what they have learned toward a green energy community project.*
- Winters, Vicki (2011). MSNS-Science
- Quayle, R. Scott (2010). C&I, *Strengths and limitations of calculator use in the mathematics classroom.*
- Waring, Tom (2010). C&I, *Reading in the elementary school: Addressing comprehension, vocabulary, phonics and whole language through research literature.*
- Adami, Mandi (2009). MSNS-Science, *Preferences for parental involvement in science.*
- Hoffman, Holly (2009). *Trends in teaching strategies and their influences on science teachers.*
- Jungck, Brant (2009). MSNS-Science, *The good, bad, and ugly of technology rich environments: 1-to-1 Computing.*
- Moravek, Gail (2009). MSNS-Mathematics, *Questions and implications to consider before implementation of a one-on-one computing program.*
- Strube, Teresa (2008). MSNS-Science, *Learning in science: A post-modernistic critical analysis of geological pedagogies in juvenile academic settings.*
- Buth, David (2007). MSNS-ENR, *Special Places: Their meanings for prospective teachers.*
- Schlaman, Yvonne (2006). MS-Interdisciplinary Studies, *Examination of student learning and the efficacy of various teaching tools used in instruction.*
- Anderson, Jesse (2005). MSNS-ENR, *Effectively teaching science through inquiry.*
- Byrd, W. Bud (2005). MSNS-Science, *Archery and energy: An interdisciplinary unit for ninth grade physical science and physical education.*
- Powell, Ron (2005). MSNS-Science, *Mapping of Casper Mountain ski trails using GPS/GIS technology.*
- Jarzab, Danette (2004). MSNS-ENR, *Integrating Geographic Information Systems (GIS) with watershed studies in Wyoming.*
- York, Amy (2003). MSNS-Science, *Integrating language arts into the second grade insects FOSS science kit.*
- Catchpole, Sharon (2002). MSNS-Science, *Technology integration to enhance learning in earth science.*

Undergraduate

I am currently advising six undergraduate students. My load has varied from as many as 22 down to five, depending on my graduate advising responsibilities.

Courses Taught

Undergraduate

- EDEL 1000 Hot Topics in Education (2 semester credits)
- EDEL 1410 Elementary School Math Seminar I (1)
- EDEL 1420/2410 Elementary School Math Seminar II (1)
- EDEL 1430 Life Science in the Elementary School (1)
- EDEL 1440 Physical Science in the Elementary School (1)

- EDEL 1450 Earth Science in the Elementary School (1)
- EDEL 4409 Elementary Math/ Science Education (6)
- EDCI 4000 Environmental Education for Teachers (3)
- EDCI 4340 Integrating Computer-Based Technologies in the Classroom Using the Internet (3)

Graduate

- EDCI 5250 Advanced Topics in Pedagogy (3)
- EDCI 5870 Theory, Research and Praxis (3)
- ESCI 5100 Seminar in Science Education
- ESCI 5600 History and Philosophy of Science and Mathematics Education (3)
- NASC 5185 Analysis of Data in the Media for the Middle-Level Learner (3)
- NASC 5215 Using Instructional Technology for Middle Level Mathematics (3)
- NASC 5400 Spatial Data Instructional Technology (3)
- NASC 5480 Introduction to GIS in the Classroom (3)
- NASC 5690 Seminar in Earth Science: Integrating Spatial Data Instructional Technology (1)
- NASC 5690 Seminar: Science and Technology (1)
- NASC 5770 Investigations in Natural Science for Secondary Teachers: GIS/GPS (3)
- NASC 5770 Investigations in Natural Science for Secondary Teachers: Remote Sensing
Concepts and Applications in the Classroom (2)

K-12 Outreach

Coordinated Resource Management in the Classroom

Locations: Rock Springs, Douglas, Thermopolis, Powell

Global Learning and Observation to Benefit the Environment (GLOBE)

Locations: Laramie, Jackson, Teton Science School, Casper

School of Energy Resources Summer Energy High School Institute

Location: Laramie

GIS and Remote Sensing Workshops

Locations: Rapid City, SD, Gillette, Casper, Rock Springs, Laramie, Cheyenne, Riverton

Robotics and Gaming

Locations: Laramie, Evanston, Casper, Worland, Philadelphia, PA

Energy Education

Locations: Laramie, Casper, Douglas, Dubois

Un-Funded Grant Proposals (\$7,202,464)

Year	Funding Agency	Title	PIs	Role	Request
2019	NSF	Deepening College Students' Understanding of Molecular Processes Using Augmented Reality and Integrated Social Learning	Prather, J. Bowman, G. Buss, A.	Co-PI	\$749,950
2017	NSF	EXP: Deepening College Students' Understanding of Molecular Processes Using Augmented Reality	Bowman, G. Alexander, E. Prather, J. Buss, A. Gamboa, R.	Co-PI	\$550,000
2016	NSF	Strategies: The Bessie Coleman Project – Using Computer Modeling, Robotics, and Flight Simulation to Create STEM Pathways	Leonard, J. Burrows, A. Davis, J. Gamboa, R. McBride, S.	Senior Personnel	\$1,199,416
2013	NSF	Enhancing Science Teacher Capacity (ESTC) Through Wyoming's Ecology	Brown, E. Katzmann, J. Buss, A. Leonard, J.	Co-PI	\$291,394
2013	NSF	Wyoming Interns to Teacher Scholars (WITS) Program	Leonard, J. Chamberlin, M. Buss, A. Clementz, M.	Co-PI	1,449,993
2012	Wyoming Math Science Partnership	Science for the Future: Redesigning Science Education via the Grand	Myers, J. Lyford, M. Buss, A. Houseal, A.	Co-PI	\$287,989

		Challenges of Energy, Water and Climate			
2012	NSF	Using Technology to Bring Visualization to Energy Education in STEM Courses: Phase I – A Proof of Concept Evaluation	Myers, J. Buss, A. Hamann, J.	Co-PI	\$173,769
2011	NSF	Simulating Field Investigations and Science Through Technology: Preparing Students to Address Environmental Grand Challenges	Myers, J. Buss, A. Hamann, J.	Co-PI	\$200,000
2011	NSF	SimSTS: A Framework for Undergraduate Exploration of the Scientific, Technological and Societal Facets of the Grand Challenge	Myers, J. Buss, A. Hamann, J.	Co-PI	\$599,987
2010	NSF	SimSTS: A Framework for Undergraduate Exploration of the Scientific, Technological and Societal Facets of the Grand Challenges	Myers, J. Buss, A. Hamann, J.	Co-PI	600,000
2009	UW School of Energy Resources	Meeting the Grand Challenges: Developing Interactive, Earth Science Computer Simulations for Teaching Scientific Uncertainty	Myers, J. Buss, A. Hamann, J. Lyford, M.	Co-PI	\$599,966
2009	NSF	Meeting the Grand Challenges: Developing Interactive, Earth Science Computer Simulations for Teaching Scientific Uncertainty	Myers, J. Buss, A. Hamann, J.	Co-PI	\$500,000
2004	NSF	The Northwest Wyoming Science Partnership	Ellsworth, J. Beiswenger, R. Hoffman, L.	Key Personnel	
1997	Wyoming Eisenhower	Wyoming Teachers Virtual Community	Hutchison, L. Buss, A.	Co-PI	

	Professional Development Program				
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