DR. ABHIK ROY

EDUCATION

Western Michigan University
Ph.D. in Program Evaluation — Kalamazoo, MI

Dissertation. Building an Evaluation Model of Academic Advising's Impact on Progression, Persistence, and Retention Within University Settings

Michigan Technological University
M.S. in Mathematics — Houghton, MI

Thesis. Quotient Rings of the Eisenstein Integers

West Virginia Wesleyan College
B.S. in Mathematics — Buckhannon, WV

Terminal Study. 4-Cell Embedding on a n-genus Torus

PROFESSIONAL EXPERIENCE

2023 | 2016

Assistant Professor
West Virginia University — Morgantown, WV

- Authored and co-authored 10+ peer-reviewed publications, contributing to various fields including program evaluation.
- Conducted over 20 rigorous evaluations leading to increases in program effectiveness.
- Designed and deployed multiple interactive surveys using HTML, CSS, and JavaScript on the Qualtrics platform, eliciting responses from a total of about 7,000 respondents.
- Extracted and cleaned data from multiple remote sources; developed and published 20+ interactive visualizations for public reporting and client dissemination using Rmarkdown and Shiny.
- Mentored 4 Masters and Doctoral students, guiding them to successful completion of their academic research projects.
- Taught courses in evaluation, measurement, research methods, and survey design, with a focus on data science techniques, to over 500 students.

2016 | 2014

Data Analyst
University of Kansas — Lawrence, KS

- Conducted comprehensive studies using qualitative, quantitative, and mixed-methods approaches, and presented findings to senior management, influencing policy changes.
- Crafted tailored evaluations that met the needs of diverse stakeholders, resulting in actionable insights for multiple non-academic departments.
- Designed and administered surveys to over 300 university students and staff, achieving response rates ranging from 47% - 91%.
- Engineered web applications using R and Tableau, streamlining data extraction and visualization processes.
- Spearheaded research initiatives that increased student retention rates by 3% - 5% through predictive statistical modeling.

CONTACT INFORMATION

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0000-0002-7085-8964

EXPERTISE

Data visualization

Markup using LaTeX

Program evaluations from planning to reporting

Quantitative, qualitative, and mixed method studies

programming

Social network analysis

Survey design, administration, and research

Statistical modeling and analysis

Text analytics

Web application development and static/dynamic reporting using

SELECT PUBLICATIONS

2024 Experiences and Perceptions of Engineering Students Towards Cross-Disciplinary Course Using Sentiment Analysis
Journal of Civil Engineering Education

Dey, K., Rahman, M.T., **Roy, A.**, Pyrialakou, V.D., Martinelli, D., Fraustino, J.D., Deskins, J, Rambo-Hernandez, K.E., & Plein, L.C. https://doi.org/10.1061/JCEECD/EIENG-1976

2023 Teaching science via computational thinking? Enabling future science teachers' access to computational thinking.
Contemporary Issues in Technology and Teacher Education

Kale U., Kooken, A., Yuan, J., & **Roy, A.** https://citejournal.org/volume-23/issue-3-23/science/teaching-science-via-computational-thinking-enabling-future-science-teachers-access-to-computational-thinking

2023 Program evaluation standards for utility facilitate stakeholder internalization of evaluative thinking in the West Virginia Clinical Translational Science Institute.
Journal of Multidisciplinary Evaluation

Curtis, R., **Roy, A.**, Lewis, N., Dooty, E. N., & Mikalik, T. https://journals.sfu.ca/jmde/index.php/jmde_1/article/view/831

2022 Thinking processes in code.org: A relational analysis approach to computational thinking computer science education.
Computer Science Education

Kale, U., Yuan, J., & **Roy, A.** https://doi.org/10.1080/08993408.2022.2145549

2021 There's so much to do and not enough time to do it! A case for sentiment analysis to derive meaning from open text using student reflections of engineering activities.
American Journal of Evaluation, 42 (4), 559–576.

Roy, A., & Rambo-Hernandez, K.E. https://doi.org/10.1177/1098214020962576

2020 To design or to integrate? Instructional design versus technology integration in developing learning interventions.
Education Tech Research Dev 68, 2473–2504.

Kale, U., **Roy, A.** & Yuan, J. https://doi.org/10.1007/s11423-020-09771-8

2020 Using interactive theater to promote inclusive behaviors in teams for first-year engineering students: A sustainable approach.
Development of A Holistic Cross-Disciplinary Project Course Experience as a Research Platform for the Professional Formation of Engineers.
Dey, K.C., & Rahman, M.T., & Pyrialakou, V.D., & Martinelli, D., & Rambo-Hernandez, K.E., & Fraustino, J.D., & Deskins, J., & Plein, L.C., & **Roy, A.R.** https://peer.asee.org/29592

2018 General chemistry student attitudes and success with use of online homework: Traditional-Responsive versus Adaptive-Responsive.
Journal of Chemical Education, 95 (5), 691-699.

Richard-Babb, M., Curtis, R., Ratcliff, B., **Roy, A.R.**, & Mikalik, T. https://doi.org/10.1021/acs.jchemed.7b00829

2018 To go virtual or not to go virtual, that is the question: A comparative study of face-to-face versus virtual laboratories in a physical science course.
Journal of College Science Teaching, 48 (2), 59-67.

Miller, T.A., Carver, J.S., & **Roy, A.R.** https://www.jstor.org/stable/26616271

2014 Reasoning-and-proving in algebra: The case of two reform-oriented U.S. textbooks.
International Journal of Educational Research 64., 92-106

Davis, J.D., Smith, D.O., **Roy, A.R.**, & Bilgic, Y. K. https://doi.org/10.1016/j.ijer.2013.06.012

2012 What's in a Scriven number?
Journal of MultiDisciplinary Evaluation, 8 (19), 41-45.

Roy, A.R., Hobson, K.A., & Coryn, C.L.S. https://doi.org/10.56645/jmde.v8i19.372

BOOK CHAPTERS

2014 Social network analysis: Finding meaning in connections.
Nova Science Publishers, Inc.

Roy, A.R. 978-1-53612-734-8

INVITED CONTRIBUTIONS

2012 What is a Scriven number?
The American Evaluation Association Newsletter

Roy, A.R., Hobson, K.A., & Coryn, C.L.S.

EVALUATIONS

ACTIVE

Current | 2023 *Lead Program Evaluator & Methodologist* - Healthy Start Initiative (*HRSA-19-049* Total Award: *$5,470,000*)
West Virginia University Research Corporation — Morgantown, WV

- Conducted process, monitoring, and impact evaluations at the program level.
- Designed and validated survey tools, evaluating the experiences of more than 50 participants.
- Generated two comprehensive internal evaluation documents and prepared an evaluation proposal aimed at federal funding renewal.
- Utilized a mixed-methods design to independently analyze both longitudinal and cross-sectional data, focusing on the smoking cessation efforts of mothers and the experiences of new or distant caretakers/fathers.

Current | 2022 *Program Evaluator & Mixed Methods Analyst* - Teaching Science with Computational Thinking: Preparing Preservice Elementary Educators of the Future STEM Workforce (*2019-NSF 2142274* Total Award: *$294,958.00*)
West Virginia University — Morgantown, WV

- Administered process evaluations for all program activities.
- Created and employed a longitudinal mixed-method study to reduce and analyze more than 50 open-ended survey responses and six interview session transcripts, leveraging thematic/content analyses and techniques including HDBSCAN/t-SNE, k-Means, and PCA.
- Designed and validated two survey tools for assessing progress and evaluating programmatic impact.
- Produced one in-depth internal evaluation document and crafted evaluation summaries for federal reporting purposes.

COMPLETED

2022 | 2017

Community Program Evaluator & Data Scientist - WVCTSI: West Virginia Clinical and Translational Science Institute (*2017-NIH 2U54GM104942-02* Total Award: *$20,000,000*)

West Virginia University — Morgantown, WV

- Analyzed extensive datasets using both frequentist and Bayesian methodologies, guiding the direction and activities of eight distinct programs.
- Authored quarterly reports as well as internal and external annual evaluation documents, disseminated both in print and through interactive formats developed in Rmarkdown.
- Crafted over 100 data visualizations and developed over four Shiny applications for internal and public data exploration, including research collaborations using social network analysis, grant activities pulled from the NCBI API crossed with WVCTSI grant numbers, and dissemination of result and changes in practice within and beyond West Virginia.
- Designed and disseminated tailored Qualtrics surveys enhanced with HTML, CSS, and JavaScript, reaching an audience of over 5,000 individuals.
- Led local and multi-site, multi-cluster evaluation studies that influenced five core medical research and community engagement units.
- Mentored six aspiring graduate students in social data science, steering them through successful research endeavors.

2020 | 2021

Program Evaluator - Appalachian Gerontology Experiences - Advancing Diversity in Aging Research (*2020-NIH 1R25AG059558-01A1* Total Award: *$678,000*)

West Virginia University — Morgantown, WV

- Developed and distributed two customized interactive surveys using Qualtrics, enhanced with CSS and JavaScript, to gather feedback on programmatic activities from a specific group of 24 students.
- Spearheaded three distinct evaluative studies focusing on student efficacy, engagement, and motivation.
- Produced an external evaluation summary for federal reporting.

2020 | 2022

Research Methods Advisor & Specialist - Research Initiative: A Holistic Cross-Disciplinary Project Experience as a Platform to Advance the Professional Formation of Engineers (*2019-NSF 1927232* Total Award: *$200,000*)

West Virginia University — Morgantown, WV

- Conducted longitudinal studies on the experiences of 30 undergraduate students in specialized interdisciplinary courses that integrated social science and engineering, using both surveys and focus group discussions.
- Mentored 10 engineering faculty members and graduate students in the implementation of research methodologies.

2018 | 2017

Program Evaluator - Stepping UP with Avenue: Progress Monitoring: A Software Suite Helping Teachers Improve Literacy Progress For Deaf/Hard Of Hearing Students (*2017-ED H327S170012* Total Award: *$2,470,440*)

Pennsylvania State University — State College, PA

- Administered in-depth evaluations of five tools designed for assessment and engagement of the deaf and hard of hearing.
- Conducted a multi-site, multi-cluster evaluation on a large scale for all programmatic activities.
- Produced a detailed external evaluation brief for federal reporting.

2018 | 2017

Lead Program Evaluator - Cultivating Inclusive Identities of Engineers and Computer Scientists: Expanding Efforts to Infuse Inclusive Excellence in Undergraduate Curricula (*2017-NSF 1725880* Total Award: *$2,000,000*)

West Virginia University — Morgantown, WV

- Administered longitudinal surveys to over 50 participating faculty members to gauge expectations, gather feedback for improvement, and monitor shifts in DEI attitudes and perceptions.
- Applied longitudinal NLP text mining techniques such as concordance, LDA topic modeling, and sentiment analysis to analyze and summarize feedback from over 3,000 first-year engineering students concerning grant-related class activities.
- Contributed to the creation of more than 10 journal publications and academic conference presentation materials.
- Developed more than 150 static and interactive data visualizations for stakeholder exploration, both internal and external reporting, as well as for presentations and publications.
- Evaluated all four principal investigators through personnel assessments.
- Produced two in-depth internal evaluation documents and crafted summaries for external stakeholders and federal reporting purposes.

2020 | 2017

Program Evaluator - GAUSSI: Generating, Analyzing, and Understanding Sensory and Sequencing Information: A Trans-Disciplinary Graduate Training Program in Biosensing and Computational Biology (*2017-NSF 1450032* Total Award: *$3,013,779*)

Colorado State University — Fort Collins, CO

- Administered 32 interviews and focus groups, both cross-sectional and longitudinal, using unstructured and semi-structured formats to gauge the experiences of students and faculty.
- Carried out process evaluations for four grant-associated programs, leading to enhanced member tracking, increased program efficiency, and heightened participant satisfaction.
- Constructed and validated tools to measure students' ability to convey research findings to a lay audience.
- Designed semi-annual adaptive and interactive Qualtrics surveys enhanced with HTML/CSS/JavaScript, securing feedback from over 100 students and faculty with a 95% response rate.
- Developed predictive models targeting the improvement of student engagement, experience, and retention.
- Generated data visualizations for assessment and longitudinal studies, bolstering inferential statistical analyses to identify trends and support programmatic enhancements, retention strategies, and satisfaction initiatives.
- Produced nine in-depth internal evaluation documents and crafted summaries for external stakeholders and federal reporting purposes.

PRESENTATIONS

2022 — Let's get sentimental: Machine learning aided data analysis for large qualitative data sets
American Evaluation Association Annual Conference — New Orleans, LA
Seidel, T., Ferguson, C.F., & **Roy, A.R.**

2022 — Best of both worlds: Affordances of mixing machine learning and qualitative content analysis
American Educational Research Association Annual Meeting — San Diego, CA
Roy, A.R., Ferguson, C.F., Curtis, R., & Babb-Richards, M.

2020 — These aren't random words just strung together?: Using machine learning and pretty visualizations to discover topics in articles.
American Evaluation Association Annual Conference — *virtual*
Roy, A.R.

2019 — Little fish in a big pond, only fish in a little pond: How roles shape our identities as evaluators.
American Evaluation Association Annual Conference — Minneapolis, MN
Loomis, D.L., Mikalik, T.L., Curtis, R., **Roy, A.R.**, & Bernstein, M.

2019 — Evolving program logic models to meet shifting program needs: The case of WV Clinical Translational Science Institute.
American Evaluation Association Annual Conference — Minneapolis, MN
Curtis, R., **Roy, A.R.**, Bernstein, M, Loomis, D.L., & Mikalik, T.L.

2019 — The value of external evaluators when building clinical translational research infrastructure.
American Evaluation Association Annual Conference — Minneapolis, MN
Curtis, R., **Roy, A.R.**, Bernstein, M, Loomis, D.L., & Mikalik, T.L.

2019 — Using associated networks to evaluate content within courses.
American Evaluation Association Annual Conference — Minneapolis, MN
Roy, A.R., Kale, U, & Yuan, J.

2019 Why is it that writers write but fingers don't fing? Using machine learning and lexemes to make sense of nonsense.
American Evaluation Association Annual Conference Minneapolis, MN

Roy, A.R., Curtis, R., Mikalik, T.L., Loomis, D.L., & Bernstein, M.

2019 Iscovering the underlying meaning behind *get me off your f***ing mailing list?* and most other narratives.
American Evaluation Association Annual Conference Minneapolis, MN

Roy, A.R., Curtis, R., Mikalik, T.L., Loomis, D.L., & Bernstein, M.

2019 Assessing for improvement: The use of artificial intelligence to uncover potential differential impact of assignments.
American Evaluation Association Annual Conference Toronto, CN

Roy, A.R. & Rambo-Hernandez, K.

2018 That's a pretty picture of dots and lines but what does it mean?: A Q&A session with the Social Network Analysis TIG leaders.
American Evaluation Association Annual Conference Cleveland, OH

Roy, A.R., Durland, M.M., Woodland, R., & Phillips, G.

2018 Navigating buy-in and shifting evaluation needs over time in NIG Clinical Translational Research Award.
American Evaluation Association Annual Conference Cleveland, OH

Curtis, R., **Roy, A.R.**, & Mikalik, T.L.

2018 Using a mixed methods evaluation to discover how an interactive theater based model stimulates inclusive behaviors in engineering.
American Evaluation Association Annual Conference Cleveland, OH

Roy, A.R., Rambo-Hernandez, K., Hensel, R.A., & Morris, M.L.

2018 Collaboration evaluation: Using social network analysis to reveal an active undiscovered network.
American Evaluation Association Annual Conference Cleveland, OH

Roy, A.R., Curtis, R., & Mikalik, T.L.

2018 Examining the past and looking forward: The future of evaluation theory and use.
American Evaluation Association Annual Conference Cleveland, OH

Roy, A.R. & Hobson, K.A.

2017 Transforming graduate STEM Education: A theory-driven evaluation of the GAUSSI National Science Foundation Research Training (NRT) Program.
American Evaluation Association Annual Conference Washington, DC

Roy, A.R., Hernandez, P.A., Chen, T., & Paguyo, C.

2017 Program evaluation for everyone! - Constructing an online foundational course for capacity building using theorists as a focus.
American Evaluation Association Annual Conference Washington, DC

Roy, A.R. & Curtis, R.P.

2017 Three stages down! Exploring the criteria for the next generation of evaluation theorists through social network analysis.
Hawaii-Pacific Evaluation Association Annual Conference — Kane'ohe, HI

Roy, A.R. & Hobson, K.A.

2017 Content in the background: Using evaluation theorists as the principal motivator for foundational evaluation courses.
Hawaii-Pacific Evaluation Association Annual Conference — Kane'ohe, HI

Roy, A.R. & Curtis, R.P.

2015 Survey says! Students getting tired of surveys.
National Academic Advising Association Annual Conference — Las Vegas, NV

Roy, A.R. & Goetz, H.L.

2013 Influences of Hierarchical Linear Modeling in evaluation.
Aotearoa New Zealand Evaluation Association Annual Conference — Auckland, NZ

Hobson, K.A., **Roy, A.R.** & Coryn, C.L.S.

2012 Survey sample methods: Evaluators' toolbox refreshment.
American Evaluation Association Annual Conference — Minneapolis, MN

Hobson, K.A., **Roy, A.R.** & Coryn, C.L.S.

TEACHING EXPERIENCE

EVALUATION, MEASUREMENT, AND RESEARCH METHODS (2016 - 2023)

2020 | 2018 *Data Visualization*
West Virginia University — Morgantown, WV

2020, 2018

2017 *Educational Psychology*
West Virginia University — Morgantown, WV

2016 *Educational Research*
West Virginia University — Morgantown, WV

2022 | 2016 *Introduction to Research*
West Virginia University — Morgantown, WV

2022, 2018, 2017, 2016

2020 | 2018 *Measurement/Evaluation in Educational Psychology*
West Virginia University — Morgantown, WV

2022, 2020, 2018

2019 | 2017 *Mixing Research Methodologies*
West Virginia University — Morgantown, WV

2022, 2019, 2018, 2017

2023 | 2017

Program Evaluation
West Virginia University
2023, 2022, 2021, 2020, 2019, 2018, 2017
Morgantown, WV

2021 | 2017

Social Network Analysis
West Virginia University
2021, 2017
Morgantown, WV

2021 | 2017

Statistical Methods 1
West Virginia University
2021, 2020, 2019, 2018, 2017
Morgantown, WV

2022 | 2020

Survey Research
West Virginia University
2022, 2020
Morgantown, WV

MATHEMATICS (2005 - 2015)

2008

Business Calculus
Central Michigan University
Mount Pleasant, MI

2009

College Algebra
Central Michigan University
Mount Pleasant, MI

2012

Discrete Mathematics
Central Michigan University
Pittsburgh, KS

2014

Elementary Statistics
Central Michigan University
Pittsburgh, KS

2010 | 2009

Foundations of Statistics
Central Michigan University
2009, 2010
Pittsburgh, KS

2008 | 2007

Intermediate Algebra
Central Michigan University
2007, 2008
Mount Pleasant, MI

2007

Integral Calculus
Michigan Technological University
Houghton, MI

2015 | 2014

Linear Algebra
University of Kansas
2014, 2015
Lawrence, KS

2013

Mathematical Thinking Grades 6-12
Western Michigan University
Kalamazoo, MI

2014 | 2013

Mathematics Curriculum Grades 6-12
Western Michigan University — Kalamazoo, MI

2013, 2014

2005

Multivariable Calculus
Michigan Technological University — Houghton, MI

2007 | 2006

Single Variable Calculus
Michigan Technological University — Houghton, MI

2006, 2007

SERVICE

2022 | 2013

Associate Editor
Journal of MultiDisciplinary Evaluation

MEMBERSHIPS

2022 | 2012

American Evaluation Association