




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

Current
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2024

- Associate Research Scientist
Indiana University  Bloomington, IN
 - **Applying Advanced Research Methods.** Conducting quantitative, qualitative, and mixed-methods studies to address complex academic and policy-related questions.
 - **Developing Competitive Research Proposals.** Leading the creation of grant proposals by defining research objectives, methodologies, and timelines to secure external funding.
 - **Conducting Data Analysis.** Applying statistical, machine learning, and qualitative analysis tools to interpret data, generating insights that advance knowledge and inform evaluation outcomes.
 - **Engaging in Stakeholder Collaboration.** Partnering with external collaborators through a participatory approach to connect research findings with practical applications and inform policy development.
 - **Creating Accessible Data Visualizations.** Designing clear visualizations with careful consideration of diverse abilities, including different forms of color blindness, to effectively communicate research findings to a wide range of audiences.
 - **Leading Research and Evaluation Projects.** Directing research and evaluation projects, meeting project goals, budgets, and timelines.
 - **Presenting Findings.** Developing and delivering presentations of findings, methodologies, and implications to academic and interdisciplinary audiences.

CONTACT INFORMATION

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-  +1 812-727-7774
-  0000-0002-7085-8964

EXPERTISE

Data visualization

Markup using *L^AT_EX*

Program evaluations integrating both traditional and machine learning methods

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



WWW 

2023
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2016

● Assistant Professor
West Virginia University

📍 Morgantown, WV

- **Authored Peer-Reviewed Publications.** Published over 10 articles in high-impact journals, contributing to advancements in program evaluation, research methodologies, and applied social science.
- **Developed Automated Systems for Data Collection and Analysis.** Established automated systems to streamline data collection, cleaning, and analysis processes, improving efficiency and accuracy across multiple research projects.
- **Designed and Launched Innovative Surveys.** Created and implemented interactive, web-based surveys using HTML, CSS, and JavaScript on the Qualtrics platform, generating over 7,000 responses across multiple projects and studies.
- **Directed and Participated in Evaluations.** Contributed to 12 program evaluations, including serving as the lead evaluator on multiple federally funded grants.
- **Extracted, Analyzed, and Visualized Data.** Processed and visualized data from internal research and remote sources, creating over 20 interactive visualizations using RMarkdown and Shiny for academic and stakeholder dissemination.
- **Mentored Graduate Students.** Guided three Master's students and one PhD student through the successful completion of their research projects, advancing their professional development.
- **Presented at National Academic Conferences.** Delivered presentations at over 20 academic conferences, with a majority being national-level events, sharing research findings with a broad academic audience.
- **Taught Research and Methods-Based Courses.** Instructed over 500 students in evaluation, research methods, measurement, and survey design, focusing on practical, analytical skills in data science.

2016
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2014

● Data Analyst
University of Kansas

📍 Lawrence, KS

- **Administered Tailored Evaluations.** Conducted needs assessments and led participatory evaluations, particularly those focused on empowerment, for multiple non-academic units.
- **Created an Evaluation Model for Academic Advising.** Combined a Delphi study with academic advisors, mixed-methods research with student interviews and surveys, and survival analysis of student retention data to develop an evaluation model for academic advising.
- **Developed and Implemented Questionnaires.** Developed and implemented questionnaires of about 300 university students and staff, achieving response rates from 47% to 91% across multiple studies.
- **Engineered Web Applications and Dashboards.** Used R and Tableau to streamline and automate the processes of data extraction and visualization of student-level data accessed from the university's Oracle server.
- **Spearheaded Research Initiatives.** Developed statistical models that identified weaknesses and gaps in student retention strategies, contributing to a 3% to 5% increase in continuance rates for specific at-risk groups.
- **Studied the Impact of Student Services.** Applied qualitative, quantitative, and mixed-methods approaches to study the impact of academic advising and engagement initiatives on student persistence, progression, retention, and completion/graduation.

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., Kookan, 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

GRANTS

2024

- Mining for Meaning: Uniting Machine Learning and Qualitative Research to Simulate Raters in Text Analysis
National Science Foundation: NSF 19-575: Methodology, Measurement, and Statistics (MMS) - Pending  Bloomington, IN
Roy, A.R. - Principal investigator



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
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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.
 - Employed 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
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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
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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

- 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 for five core medical research and community engagement units.
- Mentored six graduate students in social data science, steering them through successful research endeavors.
- Published and presented evaluation findings in academic journals and conferences.

2020
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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, incorporating CSS and JavaScript, to gather feedback on programmatic activities from a specific group of 24 students.
- Produced an external evaluation summary for federal reporting.
- Spearheaded three distinct evaluative studies focusing on student efficacy, engagement, and motivation.

2020
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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
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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.
- Designed and conducted a multi-site evaluation.
- Produced a detailed external evaluation brief for federal reporting.

2018
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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
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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
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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	<ul style="list-style-type: none"> <i>Program Evaluation</i> West Virginia University 2023, 2022, 2021, 2020, 2019, 2018, 2017 	<ul style="list-style-type: none"> Morgantown, WV
2021 2017	<ul style="list-style-type: none"> <i>Social Network Analysis</i> West Virginia University 2021, 2017 	<ul style="list-style-type: none"> Morgantown, WV
2021 2017	<ul style="list-style-type: none"> <i>Statistical Methods 1</i> West Virginia University 2021, 2020, 2019, 2018, 2017 	<ul style="list-style-type: none"> Morgantown, WV
2022 2020	<ul style="list-style-type: none"> <i>Survey Research</i> West Virginia University 2022, 2020 	<ul style="list-style-type: none"> Morgantown, WV


∞ MATHEMATICS (2005 - 2015)

2008	<ul style="list-style-type: none"> <i>Business Calculus</i> Central Michigan University 	<ul style="list-style-type: none"> Mount Pleasant, MI
2009	<ul style="list-style-type: none"> <i>College Algebra</i> Central Michigan University 	<ul style="list-style-type: none"> Mount Pleasant, MI
2012	<ul style="list-style-type: none"> <i>Discrete Mathematics</i> Central Michigan University 	<ul style="list-style-type: none"> Pittsburgh, KS
2014	<ul style="list-style-type: none"> <i>Elementary Statistics</i> Central Michigan University 	<ul style="list-style-type: none"> Pittsburgh, KS
2010 2009	<ul style="list-style-type: none"> <i>Foundations of Statistics</i> Central Michigan University 2009, 2010 	<ul style="list-style-type: none"> Pittsburgh, KS
2008 2007	<ul style="list-style-type: none"> <i>Intermediate Algebra</i> Central Michigan University 2007, 2008 	<ul style="list-style-type: none"> Mount Pleasant, MI
2007	<ul style="list-style-type: none"> <i>Integral Calculus</i> Michigan Technological University 	<ul style="list-style-type: none"> Houghton, MI
2015 2014	<ul style="list-style-type: none"> <i>Linear Algebra</i> University of Kansas 2014, 2015 	<ul style="list-style-type: none"> Lawrence, KS
2013	<ul style="list-style-type: none"> <i>Mathematical Thinking Grades 6-12</i> Western Michigan University 	<ul style="list-style-type: none"> Kalamazoo, MI

2014
|
2013




Mathematics Curriculum Grades 6-12
Western Michigan University
2013, 2014

 Kalamazoo, MI

2005




Multivariable Calculus
Michigan Technological University

 Houghton, MI

2007
|
2006



Single Variable Calculus
Michigan Technological University
2006, 2007

 Houghton, MI



SERVICE

2022
|
2013



Associate Editor
Journal of MultiDisciplinary Evaluation



MEMBERSHIPS

2022
|
2012



American Evaluation Association