

Michael Flory, Ph.D.
mflory@pfw.edu

Qualifications Summary

Dr. Flory holds a Ph.D. in Physical Chemistry (University of Arizona) and B.S. in Chemistry Education (Purdue University). Throughout his career, he has applied scientific expertise to a variety of complex problems, with a special emphasis on challenges in education. His passion is to help educators build their use of data and research to inform decisions in classrooms, schools, and college settings.

Currently, Dr. Flory is the Analytics and Planning Director for the School of Education at Purdue University Fort Wayne. In this role, he oversees strategic planning and manages assessment systems for the college, ensuring that data are relevant, timely, and collected systematically. Using these data, he conducts institutional research on high-leverage topics for departments and programs throughout the School. Recent reports have focused on the student enrollment cycle with special attention to admissions and retention. He also provides guidance to faculty on assessment design, program evaluation, and accreditation issues. Dr. Flory teaches senior-level Physical Chemistry courses for the Department of Chemistry and has taught a graduate level course on Assessment Theory and Practice for the School of Education.

Previously, he was Senior Research Scientist at CNA, a non-profit research and analysis organization, where he applied rigorous analytic techniques and operations research to complex education issues. His primary focus areas were college and career readiness, rural education issues, and providing technical assistance (TA) to educators in the use of research and data. He has produced over 50 education reports and TA series.

Dr. Flory directed the Kentucky College and Career Readiness Alliance with the Regional Educational Laboratory (REL) Appalachia at CNA, funded by the Institute for Education Sciences (IES) from 2012-2016. In this role, he coordinated and conducted REL Appalachia research and support projects for the state of Kentucky, including needs assessment, partnership development, TA, research, and dissemination, totaling nearly \$1 million annually. From 2009-2012, he provided direct research and TA support to the Kentucky Department of Education through REL Appalachia. Dr. Flory also directed the REL Appalachia Reference Desk, which provides concise summaries and references to rigorous research in response to questions submitted by the public.

In other projects, Dr. Flory has developed frameworks and tools for educators to better classify data related to career education, uses of time, and low-performing schools. In relevant projects from CNA's Center for Naval Analyses, Dr. Flory compared military training curricula to student outcomes and international standards, and has conducted several projects related to system design. Previously, he was a graduate teaching assistant and an instructor at education camps for gifted students.

Education

2007	Ph.D. Physical Chemistry, University of Arizona Dissertation— <i>High Resolution Spectroscopy of Transition Metal-containing Free Radicals: Investigating High Angular Momentum States</i>
2002	B.S. Chemistry Education with Distinction, Purdue University

Certifications and Other Coursework

2023	Engaging Instructor Certificate, Center for the Enhancement of Learning and Teaching, Purdue Fort Wayne
2017-2019	Database Design courses, Purdue Fort Wayne
2015	What Works Clearinghouse reviewer: Group Design Studies
2010	Writing Federal Proposals, Shipley Associates
2002-2007	Indiana Teaching Certificate, Secondary Chemistry and Math

Work History

2017-Present	Purdue University Fort Wayne, School of Education, Analytics and Planning Director
2022-Present	Purdue University Fort Wayne, Department of Chemistry, Limited Term Lecturer
2009-2017	CNA Education, Sr. Research Scientist
2007-2009	CNA Center for Naval Analyses, Research Analyst
2003-2007	University of Arizona, Research Assistant
2002-2004	University of Arizona, Teaching Assistant and Mentor: General and Physical Chemistry
2002	Gifted Education Research Institute, Purdue University, Counselor
2001	Center for Talented Youth, Johns Hopkins University, Instructor

Teaching Experience

2025-Present	CHM 29000: Chemistry-based Pre-calculus Support, Purdue University Fort Wayne
2023-Present	CHM 38400: Physical Chemistry II, Purdue University Fort Wayne
2022-Present	CHM 37200/38300: Physical Chemistry I, Purdue University Fort Wayne
2020	EDU 50700: Assessment Theory and Practice, Purdue University Fort Wayne
2002-2004	Laboratory courses for General Chemistry and Physical Chemistry, University of Arizona

Peer-reviewed Publications (Chemistry)

1. Flory, M.A. and Ziurys, L.M. (2011). Millimeter-wave rotational spectroscopy of FeCN and FeNC: Determining the lowest energy isomer, *Journal of Chemical Physics*, 135(18), 184303-184313.
2. Zack, L.N., Min, J., Harris, B.J., Flory, M.A., and Ziurys, L.M. (2011). Fourier-transform microwave spectroscopy of FeCN: Confirmation of the quartet electronic ground state, *Chemical Physics Letters*, 514(4), 202-206.
3. Flory, M.A., Apponi, A.J., Zack, L.N., & Ziurys, L.M. (2010). Activation of methane by zinc: Gas-phase synthesis, structure, and bonding of HZnCH₃. *Journal of the American Chemical Society*, 132(48), 17186-17192.
4. Pulliam, R.L., Sun, M., Flory, M.A., & Ziurys, L.M. (2009). The submillimeter and Fourier transform microwave spectrum of HZnCl, *Journal of Molecular Spectroscopy*, 257(2), 128-132.
5. Flory, M.A. and Ziurys, L.M. (2008). Submillimeter-wave spectroscopy of VN and VO: A study of the hyperfine interactions, *Journal of Molecular Spectroscopy*, 247(1), 76-84.
6. Flory, M.A., Field, R.W., & Ziurys, L.M. (2007). The pure rotational spectrum of CrCN: An unexpected geometry and unusual spin interactions, *Molecular Physics*, 105(5), 585-597.
7. Tenenbaum, E.D., Flory, M.A., Pulliam, R.L., & Ziurys, L.M. (2007). The pure rotational spectrum of ZnCl: Variations in zinc halide bonding, *Journal of Molecular Spectroscopy*, 244(2), 153-159.
8. Harrison, J.J., Brown, J.M., Flory, M.A., Sheridan, P.M., McLamarrah, S.K., & Ziurys, L.M. (2007). The rotational spectrum of CoF in all three spin-orbit components of the X³Φ₁ state, *Journal of Chemical Physics*, 127(19), 194308.
9. Flory, M.A., McLamarrah, S.K., & Ziurys, L.M. (2006). Completing the 3d metal fluoride series: The pure rotational spectrum of ZnF, *Journal of Chemical Physics*, 125(19), 194304.

10. Flory, M.A., McLamarrah, S.K., & Ziurys, L.M. (2005). High resolution spectroscopy of CoS: Examining 3d transition metal-sulfide bonds, *Journal of Chemical Physics*, 123(16), 164312.
11. Flory, M.A., Halfen, D.T., & Ziurys, L.M. (2004). Perturbations in the rotational spectrum of CoCl: A submillimeter study, *Journal of Chemical Physics*, 121(17), 8385-8392.
12. Sheridan, P.M., Flory, M.A., & Ziurys, L.M. (2004). Characterizing the later 3d cyanides: The submillimeter spectrum of CoCN, *Journal of Chemical Physics*, 121(17), 8360-8368.

Peer-reviewed Publications (Education)

1. P. Kannapel and M. A. Flory. (2017). Postsecondary transitions for youth in Appalachia's central subregions: A review of education research 1995 – 2015. *Journal of Research in Rural Education*, 32(6), 1-17.
2. M. Flory and E. Cramer (2017). *Participation in Kentucky's college preparatory transition courses: An update*. (REL 2017–211). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia.
3. M. Piontek, P. Kannapel, M. Flory, & M. Stewart. (2016). *The implementation of dual credit programs in six non-urban Kentucky school districts*. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia.

Research Reports and Technical Assistance Projects (Education)

1. M. Flory and C. Sun. (2017). *Measuring college readiness under ESSA: Admissions and Placement Exams*. CNA Education.
2. M. Flory. (2017). *Manufacturing a way to career readiness: How industry measures student readiness*. CNA Education.
3. M. Flory, L. Young, and P. Kannapel. (2016). *Defining future-ready graduates in the Ohio Valley Educational Cooperative region*. REL Appalachia technical assistance series and report.
4. M. Flory, S. Lee, and P. Kannapel. (2016). *Tennessee Department of Education Early Literacy Initiative*. REL Appalachia technical assistance workshop and report.
5. M. Flory. (2016). *Policy scan: State efforts to revise college and career readiness definitions and measures*. REL Appalachia technical assistance report.
6. D.M. Leeds, M. Flory, and P. Kannapel. (2016). *Evaluating teacher absenteeism in central Kentucky*. REL Appalachia technical assistance report.
7. D.M. Leeds, M. Flory, and P. Kannapel. (2016). *Designing an evaluation framework for Kentucky's Non-Traditional Instruction Program*. REL Appalachia technical assistance series and report.
8. M. Flory and P. Kannapel. (2016). *Improving teaching and learning through action research: A REL Appalachia/KVEC partnership 2014–16 Summary*. REL Appalachia technical assistance series.
9. M. Flory, S. Lee, R. Carr, and R. Nana. (2016). *Action research video analysis*. REL Appalachia technical assistance report.
10. R. Nana and M. Flory. (2015). *Lessons learned from the 2015 summer college readiness professional development forum series*. CNA Education.
11. M. Flory and R. Nana. (2015). *Jacksonville summer professional development forum: Summary of survey results*. CNA Education.
12. P. Kannapel, M. Flory, E. Cramer, & R. Carr. (2015). *Appalachia rising: A review of education research*. CNA Education.
13. M. Flory. (2015). *Boyd County Schools: Student engagement survey results, 2014/15*. REL Appalachia technical assistance report.

14. C. Mokher, L. Jacobson, C. Ahearn, J. Atkin, M. Flory, J. Lansing, J. Pearson, J. Rosenbaum, & C. Sun. (2014). *Assessment of the Florida College and Career Readiness Initiative: Year 2 report*. CNA Education.
15. J. Pearson and M. Flory. (2014). *Beyond proficient: How three high schools in Kentucky implement mastery learning*. CNA Education.
16. D. Jonas, C. Sun, and M. Flory. (2013). *College and career ready self-assessment tool for Virginia career and technical education programs*. CNA Education.
17. M.A. Flory. (2013). *School-level data on college transition courses for 20 high schools*. REL Appalachia technical assistance report.
18. M.A. Flory. (2013). *Data profile for Eastern Kentucky College and Career Readiness Collaborative: College enrollment feedback report*, REL Appalachia technical assistance report.
19. M.A. Flory. (2013). *Framework for describing uses of instructional time in Kentucky's low-performing schools*. CNA Education.
20. K. Yamasaki, M. Flory, C. Sun, C. Mokher, and L. Holian. (2012). *Expanding Advanced Placement in northeast Tennessee*. CNA Education.
21. M.A. Flory. (2012). *The effectiveness of online Advanced Placement (AP) courses: A brief literature review*. CNA Education.
22. M.A. Flory and S. Solomon. (2011). *Results of 2011 follow-up survey for Kentucky Leadership Networks*, REL Appalachia technical assistance report for Kentucky Department of Education.
23. M.A. Flory. (2011). *Parent engagement survey: State-level data*, REL Appalachia technical assistance report for Kentucky Department of Education.
24. M.A. Flory. (2011). *Read to Achieve interventions: Research at What Works Clearinghouse*, REL Appalachia technical assistance report for Kentucky Department of Education.
25. M.A. Flory. (2011). *Framing parent engagement survey data*, REL Appalachia technical assistance report for Kentucky Department of Education.
26. S. Solomon and M.A. Flory. (2011). *Leadership Networks annual survey update—teachers and administrators*, REL Appalachia technical assistance report for Kentucky Department of Education.
27. M.A. Flory and D. Burke. (2011). *School readiness screeners: Validity and reliability*, REL Appalachia technical assistance report for Kentucky Department of Education.
28. M.A. Flory. (2011). *College readiness of Career and Technical Education (CTE) completers*, REL Appalachia technical assistance report for Kentucky Department of Education.
29. M.A. Flory. (2011). *Individual Learning Plan (ILP) data revisited: High school calculation*, REL Appalachia technical assistance report for Kentucky Department of Education.
30. M.A. Flory. (2011). *World Language Program Review: Survey results*, REL Appalachia technical assistance report for Kentucky Department of Education.
31. S. Solomon and M.A. Flory. (2010). *Results of baseline survey for Kentucky Leadership Networks*, REL Appalachia technical assistance report for Kentucky Department of Education.
32. M.A. Flory. (2010). *KDE Delivery Unit objectives and data*, REL Appalachia technical assistance report for Kentucky Department of Education.
33. S. Solomon and M.A. Flory. (2010). *Selecting case study districts, Kentucky Leadership Networks*, REL Appalachia technical assistance to Kentucky Department of Education.
34. M.A. Flory. (2010). *Individual Learning Plan (ILP) software usage data*, REL Appalachia technical assistance report for Kentucky Department of Education.
35. M.A. Flory. (2010). *Identifying comparative data for large urban districts*, REL Appalachia technical assistance report for Kentucky Department of Education.
36. M.A. Flory. (2010). *AdvanceKY information*, REL Appalachia technical assistance report for Kentucky Department of Education.

37. M.A. Flory. (2010). *Program Reviews: Building a high quality evaluation*, REL Appalachia technical assistance report for Kentucky Department of Education.
38. M.A. Flory. (2010). *Program Review Pilot: District survey data*, REL Appalachia technical assistance report for Kentucky Department of Education.
39. M.A. Flory. (2010). *Program Review Pilot: School self-report data*, REL Appalachia technical assistance report for Kentucky Department of Education.
40. M.A. Flory. (2010). *Program Review Pilot: School survey data*, REL Appalachia technical assistance report for Kentucky Department of Education.
41. M.A. Flory. (2010). *Program Review training: Pre/post opinion surveys*, REL Appalachia technical assistance report for Kentucky Department of Education.
42. M.A. Flory. (2010). *Charter school research*, REL Appalachia technical assistance report for Kentucky Department of Education.
43. M.A. Flory. (2010). *Comments on KIDS NOW report for 2008-2009 (Final)*, REL Appalachia technical assistance report for Kentucky Department of Education.
44. M.A. Flory. (2010). *Program reviews: Reliability based on training scenario*, REL Appalachia technical assistance report for Kentucky Department of Education.
45. M.A. Flory. (2009). *Teacher attendance as a factor in school accountability*, REL Appalachia technical assistance report for Kentucky Department of Education.
46. M.A. Flory. (2009). *Professional development research base at KDE*, REL Appalachia technical assistance report for Kentucky Department of Education.
47. M.A. Flory. (2009). *LRC Highly Skilled Educator follow-up report*, REL Appalachia technical assistance report for Kentucky Department of Education.
48. M.A. Flory. (2009). *Regional college readiness scores in Kentucky*, REL Appalachia technical assistance report for Kentucky Department of Education.
49. M.A. Flory. (2009). *Analysis of ASSIST reports: Priority needs*, REL Appalachia technical assistance report for Kentucky Department of Education.
50. M.A. Flory. (2009). *Summary of instructional sensitivity for statewide assessments*, REL Appalachia technical assistance report for Kentucky Department of Education.
51. M.A. Flory. (2009). *Thoughts on 2007-2008 KIDS NOW evaluation*, REL Appalachia technical assistance report for Kentucky Department of Education.

Final Reports (Other)

1. D. Birchler, K. Fierstine, M. Flory, T. Geraghty, and C. Porter. (2017). *Maintaining the technical edge of the acquisition workforce*. CNA Center for Naval Analyses.
2. M. Flory and C. Porter. (2017). *Application of high-velocity learning processes to RDT&E Management*, CNA Center for Naval Analyses.
3. M.A. Flory. (2009). *Berm analysis (S)*, CNA Center for Naval Analyses.
4. L.M. Foster, M.A. Flory, N. Jiang, and W. McNavage. (2009). *The Navy Distributed Engineering Plant (DEP) Bottom Up Review: Building More Efficient Processes and Bridging Communications Gaps*, CNA Center for Naval Analyses.
5. M.A. Flory, J. Jiang, and W. McNavage. (2008). *CVN-68 Open Architecture Interoperability Development Test*, CNA Center for Naval Analyses.
6. M.A. Flory, L. Straus, and T. Matheny. (2008). *Unmanned Aircraft Systems (UAS): Training Shortfalls and Human Factors*, CNA Center for Naval Analyses.
7. L. Straus, M.A. Flory, and T. Matheny. (2008). *UAS Training and Human Factors*, CNA Center for Naval Analyses.

Invited Presentations (Education and Chemistry)

1. M. Flory. (2023). *Examining GPA and PRAXIS Outcomes in Elementary Education*. Assessment Institute, Indianapolis, IN.
2. M. Flory and B. Oliver. (2022). *Facilitating Cross-Discipline Conversations: Building Shared Awareness and Aligning Content Courses to Teacher Education Licensure Exams*. Assessment Institute, Indianapolis, IN.
3. P. Kannapel and M.A. Flory. (2016). *Dual Enrollment and Dual Credit Programs in Rural Kentucky*. National Rural Education Association, Columbus, OH.
4. M.A. Flory and P. Kannapel. (2016). *College and Career Readiness in "Middle Appalachia:" Statistics and Perceptions*. National Rural Education Association, Columbus, OH.
5. M. Flory. (2016). *Envisioning the Future of Dual Enrollment (Panel Discussion)*. National Alliance of Concurrent Enrollment Programs, Louisville, KY.
6. P. Kannapel and M.A. Flory. (2015). *Education Issues and Needs in "Middle Appalachia:" 1995-2005 and Tomorrow*. National Rural Education Association, St. Louis, MO.
7. D. Jonas and M.A. Flory. (2014). *Does my CTE Program Measure Up? A Self-assessment Tool for College and Career Readiness*. National Association of Career and Technical Education Information, Louisville, KY.
8. M.A. Flory. (2014). *Participation and Pass Rates for College Preparatory Transition Courses in Kentucky*. Ohio Valley Educational Cooperative, Shelbyville, KY.
9. M.A. Flory. (2014). *Planning a System of Interventions to Prepare Students for College and Careers: Lessons from Research and Practice*. REL Appalachia Bridge event, Lexington, KY.
10. M.A. Flory and P. Kannapel. (2014). *REL Appalachia: Overview of REL program and college and career readiness research in Kentucky*. Kentucky Education Research Roundtable, Frankfort, KY.
11. M.A. Flory. (2013). *School-level data: College transition courses in Kentucky*. Southeast/South-Central Educational Cooperative, London, KY.
12. M.A. Flory. (2013). *Data Profile: College Enrollment Feedback Report*. Southeast/South-Central Educational Cooperative, London, KY.
13. M.A. Flory. (2012). *Rural Research in REL Appalachia*. National Rural Education Association, Cincinnati, OH.
14. L. Holian, J.D., Ross, & M.A. Flory. (2009). *Using Data to Understand and Identify Dropouts*. Graduate Kentucky Summit, Frankfort, KY.
15. M.A. Flory. (2009). *ASSIST Reports: Reporting and Analyzing Priority Needs in Low-performing Schools*. Kentucky Department of Education ASSIST team training, Frankfort, KY.
16. M.A. Flory and L.M. Ziurys. (2007). *The Pure Rotational Spectra of VN and VO*. 62nd International Symposium on Molecular Spectroscopy, Columbus, OH.
17. M.A. Flory, A.J. Apponi and L.M. Ziurys. (2007). *Activation of C-H bonds: Pure Rotational Spectroscopy of HZnCH₃ (X^1A_1)*. 62nd International Symposium on Molecular Spectroscopy, Columbus, OH.
18. E.D. Tenenbaum, M.A. Flory, R.L. Pulliam, and L.M. Ziurys. (2007). *The Pure Rotational Spectrum of ZnCl ($X^2\Sigma^+$)*. 62nd International Symposium on Molecular Spectroscopy, Columbus, OH.
19. M.A. Flory and L.M. Ziurys. (2007). *The Pure Rotational Spectrum of FeNC ($X^6\Delta_i$): It had to be there!* 62nd International Symposium on Molecular Spectroscopy, Columbus, OH.

20. M.A. Flory and L. M. Ziurys. (2006). *Sub-Millimeter Spectroscopy of Astrophysically-Important Molecules: Metal Cyanides*, NASA Laboratory Astrophysics Workshop, Las Vegas, NV.
21. M. A. Flory, P. M. Sheridan, M. A. Brewster, S. K. McLamarrah, L. M. Ziurys, J. M. Brown, and T. C. Steimle, (2006). *Lambda-Doubling in High Angular Momentum States: The Pure Rotational Spectrum of CoF($X^3\Phi_1$)*, 61th International Symposium on Molecular Spectroscopy, Columbus, OH.
22. M. A. Flory and L. M. Ziurys, (2006). *Millimeter/Sub-Millimeter Spectroscopy of CrCN ($X^6\Sigma^+$): A Preference for the Linear Structure*, 61th International Symposium on Molecular Spectroscopy, Columbus, OH.
23. M. A. Flory, S. K. McLamarrah, and L. M. Ziurys. (2006). *Completing the Study of the 3d Fluorides: Pure Rotational Spectroscopy of ZnF ($X^2\Sigma^+$)*, 61th International Symposium on Molecular Spectroscopy, Columbus, OH.
24. M. A. Flory, S. McLamarrah, and L. M. Ziurys. (2005). *Laboratory Rotational Spectroscopy of Astrochemically Interesting Metal Cyanides and Isocyanides*, Pacifichem 2005, Special Session: "Astrochemistry - From Laboratory Studies to Astronomical Observations," Honolulu, HI.
25. M.A. Flory, S.K. McLamarrah, and L.M. Ziurys, (2005). *The Pure Rotational Spectrum of the CoS Radical ($X^4\Delta_1$): Continued Studies in Monoligated Cobalt Species*, 60th International Symposium on Molecular Spectroscopy, Columbus, OH.
26. M.A. Flory and L. M. Ziurys. (2004). *The Pure Rotational Spectrum of CoCl ($X^3\Phi_1$): Characteristics of a Highly Perturbed Molecule*, 59th International Symposium on Molecular Spectroscopy, Columbus, OH.
27. S. K. McLamarrah, M. A. Flory, P. M. Sheridan, and L. M. Ziurys. (2004). *Millimeter-Wave Spectroscopy of CoO ($X^4\Delta_1$) and CoF ($X^3\Phi_1$): Identifying the High Spin Components*, 59th International Symposium on Molecular Spectroscopy, Columbus, OH.

Committees, Panels, and Advisory Boards

2025	East Allen County Schools Science Textbook Adoption Committee (Parent Rep.)
2023	Indiana Department of Education Standards Prioritization Committee (Chemistry).
2019-2020	Freshman Success Course Task Force, Purdue University Fort Wayne.
2014-2016	Kentucky Network to Transform Teaching Advisory Council, National Board for Professional Teaching Standards.
2009-2010	Evaluation Advisory Committee, Early Childhood Education Council, Kentucky Department of Education.
2009-2010	Improving Literacy Teaching and Learning Research Agenda, Collaborative Center for Literacy Development, University of Kentucky.
2005-2007	Graduate Program Committee, Chemistry Department, University of Arizona.

Professional Associations

2009-2017	Kentucky Education Research Roundtable
1998-2007	American Chemical Society

Awards

2016	Analytic Impact Award, Institute for Public Research
2007	Rao Prize, International Symposium on Molecular Spectroscopy
2006	Galileo Circle Scholar, University of Arizona
2002	Outstanding Senior Chemist, Purdue University
2001	Phi Beta Kappa
1997	National Merit Scholar