

Evaluation of research data services: What things should we evaluate? What are the proper metrics for judging success?

Charlotte L. Flynn
Syracuse University
charflynn5@gmail.com

Problem & Solution

- An emerging role for information professionals in higher education is supporting researchers in managing data.
- Evaluation of data support services and tools is limited.
 - This inhibits local project improvement and larger scale decision-making.
- Local project and broad policy evaluation information needs differ in emphasis and timeframe.
- Solution: Theory-based local evaluation supported by a cyberinfrastructure that builds local evaluation capacity and a research base that connects local activities to long-term outcomes. Urban and Trochim's (2009) Systems Evaluation Protocol (SEP) is one such approach.

We need a better way of conceptualizing evaluation than asking, "What metrics should we use?"

This question presumes:

- Evaluation = measurement
- Uniformity of measurement and evaluation questions across projects evaluation as an afterthought.
- Measurement involves passive data collection that is the same for all projects at all phases of project development.
- Measurement does not involve collecting structured data in the context of an evaluation study.
- It is possible to measure project impact outside the context of an evaluation study and without taking into account the logic of how program activities lead to long-term outcomes.

This approach to evaluation of RDM interventions is a blunt instrument that lacks mechanisms for informing improvement or meaningful comparison of interventions.

If we hope to build an infrastructure of research data support, more robust evaluation is in order. In the professional program evaluation community, measurement choices depend upon context. Central considerations are stakeholder questions and the intended use of evaluation findings.

Example: TIER Teaching Integrity in Empirical Research

- A protocol for teaching students who are doing original analysis of quantitative data to document the steps of data management and analysis to facilitate replicability.
- Students learn documentation experientially in the context of learning research methods
- For use in situations where:
 - Students do research projects using real data to engage in statistical inquiry (not prescribed analysis using assigned data).
 - Students receive instructor feedback and mentoring over the course of their project.
- Developed and implemented collaboratively over the past 10 years by Richard Ball, an economics faculty member, and Norm Medeiros, a librarian, at Haverford College.

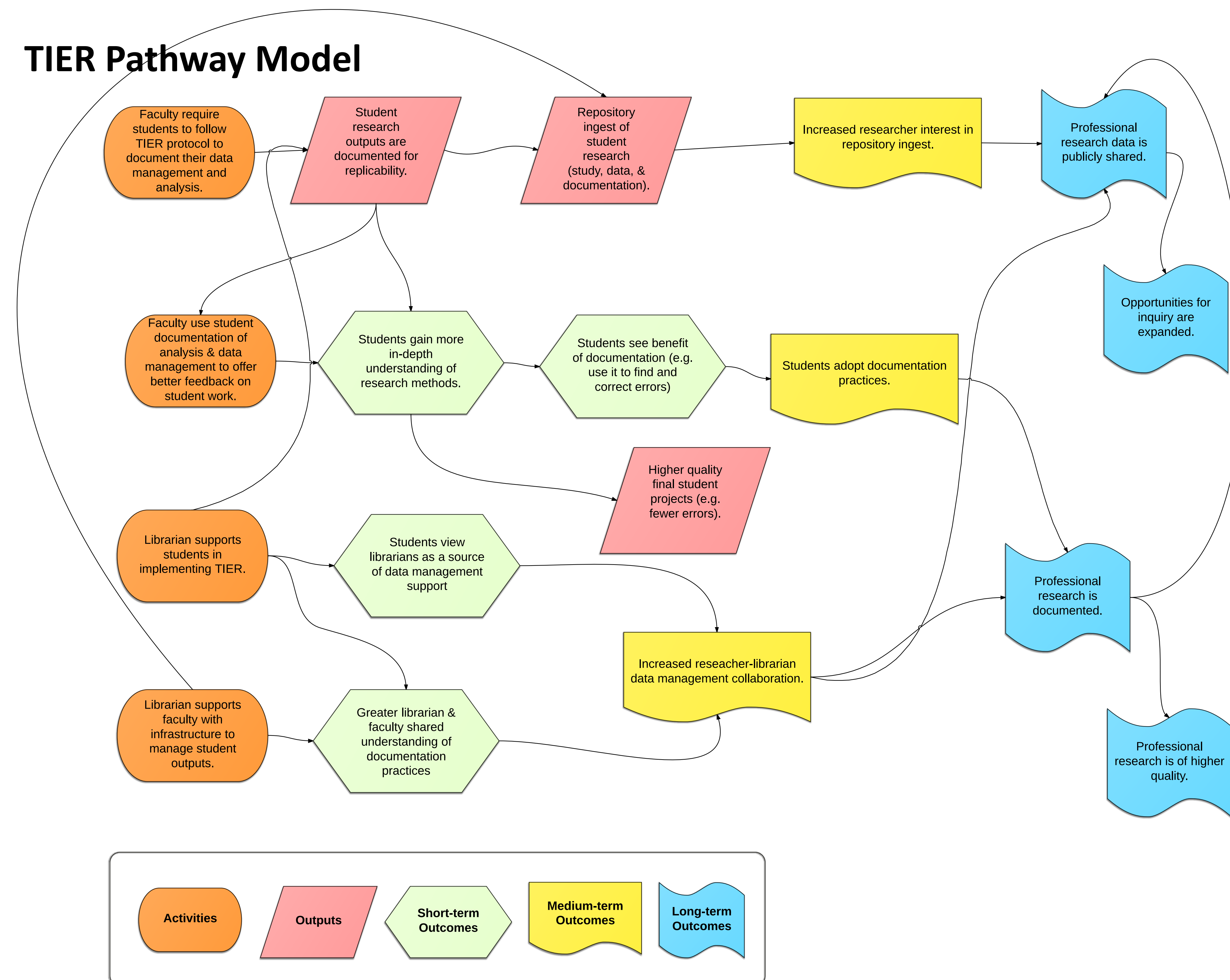
TIER Logic Model

Inputs	Activities	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
TIER protocol (procedures for assembling files to document analysis & data management → replicability)	Faculty require students to follow TIER protocol to document their data management and analysis.	Student research outputs are documented for replicability.	Students gain more in-depth understanding of research methods.	Students adopt documentation practices.	Professional research is documented.
Instructor who devotes time to offering feedback on student projects	-Faculty use student doc of analysis & data management to offer better feedback on student work.	Higher quality final student projects (e.g. fewer errors).	Students see benefit of documentation (e.g. use it to find and correct errors).	Increased researcher interest in repository ingest.	Professional research is of higher quality.
Subject liaison librarian	Librarian supports students in implementing TIER.	Repository ingest of student research (study, data, & documentation).	Students view librarians as a source of data management support.	Increased researcher-librarian data management collaboration.	Professional research data is publicly shared.
Platforms for sharing outputs during project and after	Librarian supports faculty with infrastructure to manage student output		Greater librarian & faculty shared understanding of community documentation practices.		Opportunities for inquiry are expanded.

Context: TIER was developed for use in higher education contexts where faculty supervise student empirical research projects that use real data, offering feedback over the course of the project. It can be used in the context of a quantitative social science methods courses (economics, sociology, political science, psychology) or to advise thesis projects. It can be used to advise individual or group projects.

Assumptions: Faculty in higher education settings that emphasize quality teaching (e.g. liberal arts colleges) are receptive to implementing innovations to optimize instructional quality. Academic library services are often structured to facilitate librarian-faculty collaboration via subject liaisons, which affords an opportunity for offering students experiential learning of data management best practices.

TIER Pathway Model



Factors to take into account before deciding what to measure

- Description
 - Key activities/elements participants experience that contribute to outcomes.
 - Informed by differences in information or values that shape stakeholder perceptions of the program.
- Phase of development
 - Life cycle analysis
- Theory of change
 - Expresses stakeholder understanding of how program brings about change
 - Logic model → pathway model
- Program-system links
 - Evidence that links local activities to long-term outcomes.
- Evaluation scope
 - Feasibility, credibility, accuracy, usefulness

Phases of Development

- Programs have life cycles
 - Less stability early on, trial and error
 - Tend to stabilize as they mature
 - Program phases: initiation, development, stability, dissemination.
- Evaluation should have a lifecycle
 - Early on = rapid feedback for program improvement
 - Once program stabilizes and is disseminated, evaluation should entail greater social science rigor.
 - Over the course of a program, evaluation questions attend first to process, then change, then comparison, then generalization.

References

- Ball, R.J. & Medeiros, N. (2012). Teaching integrity in empirical research: A protocol for documenting data management and analysis. *Journal of Economic Education*, 43(2), 182-189.
- Shadish, W. R., Cook, T. D., & Leviton, L. C. (1991). Foundations of program evaluation: Theories of practice. Sage.
- Smith, N. L., & Brandon, P. R. (Eds.). (2008). Fundamental issues in evaluation. Guilford Press.
- Trochim, W., Urban, J. B., Hargraves, M., Hebbard, C., Buckley, J., Archibald, T., Johnson, M., & Burgermaster, M. (2012). The guide to the systems evaluation protocol. Ithaca, NY: Cornell Digital Print Services.
- Urban, J. B., & Trochim, W. (2009). The role of evaluation in research—Practice integration working toward the “Golden Spike.” *American Journal of Evaluation*, 30(4), 538-553

Teaching Integrity in Empirical Research
<http://www.haverford.edu/TIER/>