bio-itest

new frontiers in bioinformatics and computational biology

Northwest Association for Biomedical Research
Bio-ITEST Program

The Northwest Association for Biomedical Research (NWABR: www.nwabr.org) works to promote understanding of biomedical research and its ethical conduct. In service to one of its key missions—inspiring students and supporting excellence in science teaching—NWABR has developed an innovative two-part bioinformatics curriculum (available at http://nwabr.org/landing/teachers), funded by a National Science Foundation grant, called Bio-ITEST (Innovative Technology Experiences for Students and Teachers). The three-year grant provides funding for education outreach programs that help secondary school teachers and their students learn about how information technology is used in biological research, as well as the career possibilities in the fields of bioinformatics and computational biology. NWABR supports its curriculum through teacher professional development workshops and individual assistance. Bio-ITEST collaborators include Digital World Biology, EdLab Group, and Shoreline Community College, among others. The program also draws on NWABR's strong relationships with school districts, community groups, bioethicists and NWABR member research institutions.

The Bio-ITEST Evaluation

Strategy: The external evaluation incorporates two intertwined areas of inquiry. First, it investigates the correlation between teacher engagement in professional development activities, implementation of project curriculum, and student changes in four areas that underpin student motivation to enter science occupations: career **awareness**, students' understanding of the subject matter's **relevance** to their lives, **self-efficacy** in undertaking scientific tasks, and **engagement** with science subject matter and careers. Second, the evaluation explores the role secondary science teachers play in increasing student awareness of, and interest in, science careers.

Methods: The correlational study uses a longitudinal design to evaluate program impact on teachers and the extent to which student change in the four construct areas correlates with teacher change from pre- to post-program participation. The evaluation also uses several qualitative data collection strategies: structured interviews and focus groups with study participants, key informant interviews, and site observations of both the program's professional development activities and teacher implementation of curriculum in classroom settings.

Results: Teachers and students show significant pre-/post-participation gains. Qualitative results document an emerging role for science teachers in attracting students to STEM careers. The evaluation has also uncovered innovative and replicable strategies teachers use that can foster student change in the four conceptual constructs. Science teachers can potentially play an increasingly important, and not yet fully recognized, role in contributing to student motivation to enter STEM careers. The study raises policy implications for teacher preparation and professional development and provides concrete and replicable examples that can inform changes in teacher practice to better prepare students for STEM careers.

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For More Information

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Positioning a Project for Scale-Up: What should an evaluator consider at project outset?

Evaluation Support Area	Purpose	Bio-ITEST Examples	Considerations/Lessons
Articulate a Theory of Change (ToC)	• A clear and compelling ToC serves as cornerstone in demonstrating how project activities will result in intended outcomes. • ToC is an asset in securing stakeholder understanding of scale-up potential. • Engaging in a ToC process supports evaluation capacity-building.	• Facilitated discussion at leadership team meetings in order to uncover underlying assumptions about how project activities would result in achieving identified outcomes • Drafted ToC graphic for further development by project staff	• Requires evaluator to educate project on value of ToC, as well as process and uses • Level of project staff leadership interest in, and time to, develop a ToC
Develop and implement a strong evaluation plan	• Ensure a robust data collection strategy. Implement rigorous and appropriate measures that can potentially inform scale-up evaluation design. • Keep a focus on identifying aspects of the project that could be ripe for scale-up: either replication (i.e., both what can be, and what should be, replicated) or "deepening of impact."	• Rigorous correlational study design • Use of mixed methods approach including surveys, site observations, and structured interviews	• Program readiness and capacity to support data collection plan and to ensure fidelity of implementation • Evaluation plan must match current program needs (e.g., developmental). Current needs may not be the same as future needs. • Findings may, or may not, provide clear guidance on value of scaling-up.
Participate as a project partner in planning activities	• Participation in planning builds evaluation capacity. • Evaluators can share, in a timely way, findings and insights on implications for program improvements. • Regular evaluator involvement supports early readiness for scale-up and replication.	• Quarterly report of findings and implications sent prior to each Leadership Team meeting • Evaluator participation at all Leadership Team and Advisory Board meetings	• Evaluator/Project staff comfort level with evaluator's taking on team member role
Stay attuned for opportunities to surface new ideas and innovations	• An external evaluation may see a "bigger picture" and place the value of the work in a larger context. • An evaluator can help a project envision and realize its value.	• Developed new line of inquiry with policy and practice implications (study of emerging role of science teachers in fostering STEM career awareness)	• Level of project interest in entering a new area • May require bringing in new players/partners • Does the new area align with their mission?
Disseminate findings strategically	• Dissemination of findings through different modalities can reach multiple audiences. • Strategic dissemination can be used to capture feedback that may inform scale-up/replication ideas.	• Opinion pieces • Briefs • Journal submissions • Conference presentations • Reporting findings back to project participants	• Be prepared to be flexible and to modify/add on to contractual commitments. • Reserve evaluation resources to be able to respond to unforeseen opportunities. • May face competing values in coming to agreement on dissemination efforts.

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