Environmental Health Sciences as an Integrative Context for Learning

Annual Grantee Meeting
April 25 & 26, 2005
Hosted by Bowling Green State University

Summary

Welcome and Introductions

Chris Keil and Jodi Haney, Bowling Green State University, welcomed meeting participants to the Lake Erie Center that is a part of the University of Toledo. The Center is a collaborative between the University and Bowling Green State University and actively supports groups that research issues related to the great lakes or that pursue educational activities. Jodi led an excellent balloon icebreaker.
Liam O'Fallon, National Institute of Environmental Health Sciences, thanked the Project EXCITE team, especially Jennifer Zoffel. He then welcomed all the new participants and team members. Finally he reviewed the purpose and structure of the meeting.

State Department of Education

Katie Frevert, University of Washington, Moderator
Areas of attention included: 1)Key components to successful long-term engagement with State Education 2) Role of the State Department of Education with EHSIC from six states; curriculum implementation and systemic reform 3) Pathways to continued funding at a state and national level. The primary take home message was to ensure "Rigor, Relevance and Relationships" for continued success.

Participants:

- Becky Bell
  Maryland State Department of Education
- Dick Dieffenderfer
  Ohio Department of Education
- Georgia Glasgow
  New Mexico- Public Education Department
- Susan Holt
  NYS Biology-Chemistry Mentor Network
- Annette Jacobson
  Oregon Department of Education
- Becky Kennedy Koch
  Ohio Department of Education
- Eric Wuersten
  State of Washington- Office of the Superintendent of Public Instruction

Consolidation of input from state representatives:

Research:

- Make student that literacy achievement data etc. available to the state.
- Demonstrate the success of interdisciplinary models to the state (-it is a way of teaching more than a curricular product).

- States do value alternative data such as: attendance improvement, process skills, attitude/behavior, and disciplinary actions changes.

Standards:

- Addressing 'more' standards is not necessarily better. It is best to do a good job on a few than to weakly address many standards in a blanket approach.
- Focus on standards that make sense.
- Look into 'hard to address' standards (states want to know there are good resources to reach all standards).
- Don't miss these relevant content areas: Technology, Health, Service Learning, Family Consumer Sciences, Human Problems and Impacts (content area).

Sustainability:

- Work with state promoted professional development opportunities for teachers.
- Pre-service teachers are a welcome targets- open to new 'ways to teach.'
- Leverage University-Partnerships toward pre-service teachers.
- Leverage the EHSIC parent-community connections.
- Work with districts professional development goals and opportunities.

Action Items:

- Compile EHSIC data; create a site (place) to put all studies, where one could come to document successes.
- Maintain discussion with state, meet regularly.
- Include State Department in monograph.
- Connect to SEER (active in several states) EE and others for collaboration opportunities.

Strategic Planning for Collective EHSIC Monograph

Kendra Mingo, Oregon State University, Moderator

Participants will plan and begin to assemble an EHSIC monograph that will provide recommendations in key topic areas to individuals (i.e. teachers, school/district administrators or state department of education professionals) who are contemplating using EHS as an integrative context for learning at the school, district or state level.

There was a lot of good discussion in this group. Of greatest issue was the target audience. People wanted to know if this monograph was intended for use by teachers or administrators as that would affect the content and format of the chapters. Other questions included whether ASCD is the best publisher and should we also consider developing other monographs with different foci (eg one with greater data focus, policy barriers). It was suggested that we could consider a book to accompany a larger textbook. It was also mentioned that "Learning by design" might be a good model. Participants emphasized the need for defining environmental health early on in the book. Participants also emphasized the need to make the case for why integrative context is important, especially during a time when teachers and administrators feel the pinch of time, money and need to meet testing goals. "First, do no harm" – demonstrate that integration does not hurt academic performance. Highlight impact of integration and possibility of saving time.

The group decided to focus primarily on teachers with an emphasis on how to do integration, rather than on why. Another big decision was to highlight integrative education rather than environmental health. Participants expressed concern that putting "environmental health" in the title might turn off would-be teachers. Therefore, integrative education would be primary focus, then throughout the book we would emphasize how the projects used environmental health to do this. The book would be organized in a way that it would be a "how-to" resource for teachers interested in implementing integrative curricula into their

school. It would include general and specific details, templates, and web addresses to existing materials. The group came up with a very rough outline of monograph sections.

Introduction

Making the case
Integration
Environmental Health
The primary audience of this section is administrators. The purpose is to make them understand the benefits of integration. We will make the case by using data that we have from the EHSIC program and support it with other data from research articles. We will demonstrate the uniqueness of environmental health and why its natural interdisciplinary nature makes it best for integrative teaching.

Big picture of integration
What integration is and how it is developed and implemented within a school. We will provide readers with a logic model of integration in this section.

Universals of integration
No matter the grade level or the school, there are some aspects of integration that are the same. This section will discuss some of those universals.

Specifics of integration
This section will be the 'how-to' portion. We will base this section on the logic model to show teachers how they can get an integration model implemented within their classroom and school that meets their needs. It will contain essential tools that EHSIC grantees have found useful in their projects.

Troubleshooting
This section will present the very real challenges that teachers and administrators will likely face as they try to implement an integrative curriculum. It will provide solutions EHSIC grantees used to overcome these challenges.

Evaluation and sustainability
This section will provide teachers and administrators rubrics to evaluate the success and impact of the curriculum on teachers, students and the school. It will offer ways to ensure the sustainability of the efforts.

During the report back session, the group received excellent feedback. A possible working title could be "Engaging All Students." Rather than a flow chart, it was suggested that we consider developing a logic model to depict the integration process from beginning to end. The whole group supported the development of this monograph with teachers as the primary audience. It was recommended that the book could have a section "Getting started for administrators" and another "Getting started for teachers." There should also be a discussion of alignments.

Timeline: Rough draft of a book complete by 2006 annual grantee meeting (May 2006).

Actions: A group (one representative from each project) will come together for an initial conference call in early June to discuss the development of a logic model for integration. Determining the pieces of the model will guide the group on the different chapters within the Specifics of integration section. Nancy Moreno will lead the group on the development of the logic model. Liam will coordinate the call. Jodi Haney will send everyone the SEER report and the Loucks Horsely model. Camille will contact researchers in Denmark who've done work on integrative education. Kendra will send out a message to the EHSIC grantees asking that they send her any information on research articles on integrative education. Eric to send out examples of logic models. Define system to write book – David has experience writing books and Jodi has experience reviewing them.

Publishing and Dissemenation

Nancy Moreno, Baylor College of Medicine, Moderator

The purpose of this session was to provide grantees with a sense of the various dissemination models that can be employed for their curricular materials. Grantees discussed which models are most appropriate for their needs and for their project. Grantees then heard a presentation by Mr. Clinton Turner on Science NetLinks a web resource run by the American Association for the Advancement of Science (AAAS).

Nancy discussed dissemination models that grantees could use, highlighting her personal experiences and efforts in getting BCM materials disseminated more widely. During the discussion, grantees decided that the approach selected needs to be appropriate for the individual project.

Mr. Turner showed participants the power of Science NetLinks and how it can be used as a mechanism to disseminate curricular materials. He highlighted Marco Polo. He outlined the process for evaluating materials and how to submit them to AAAS.

Mr. Turner and Mr. O'Fallon will meet in DC to follow-up on continued interactions between AAAS and NIEHS science education grantees.

Evaluation Strategies

Dina Markowitz, University of Rochester, Moderator

The overall theme of the evaluation working group was that the EHSIC grantees need to use their evaluation to demonstrate the impact of their EHSIC projects.

The evaluation working group began with a discussion of the purpose of the EHSIC initiative, as per the grant RFA document:

- Utilize environmental health science as an integrating context to be implemented in K-12 curricula that will….
- Improve overall academic performance as well as…
- Enhance student overall awareness and knowledge of environmental health science.

Camille led the group through a document outlining the different evaluation strategies. Her take home message was that it is very important to use different mechanisms to most effectively assess impact. She raised many questions about ability to have true control groups, reliability of data, and notion of assessing impact by student performance on standardized tests. We then had presentations that examined the differences between developmental and implementation evaluation.

The University of Miami talked about the importance of project evaluation. Lisa Pitman explained how doing program evaluation early in the grant helped them to modify their curriculum and teacher workshops to have greater teacher impact. It also led to the development of new materials. She showed us some video clips from their teacher workshops.

The University of Rochester team talked about their evaluation strategies for their different project phases.

Chris Keil from Bowling Green gave an overview of their evaluation strategy. He explained how they are focusing primarily on teachers and secondarily on students. He walked the group through each of the components and how they are evaluating them. For students, he mentioned that they are looking at standardized test performances, but that the data is very difficult to collect. Attendance is another measure of enthusiasm for coming to school. They are using the Horizons Observation Protocol (HOP) and POPs to assess student impact.

The group discussed what is meant by "academic success" and "overall performance", and how to measure these objectives, and does this clearly indicate they be measured using standardized tests. Grantees discussed the difficulties of using standardized testing as a measure of academic success (each state uses

different tests; tests can change each year and many are not validated. Furthermore, some schools and some subject areas do not use standardized tests). Regardless, State Departments of Education look at student performance on standardized tests when selecting use of innovative curriculum.

In order to measure the success of EHSIC projects without having to rely solely on standardized tests, the group discussed the need to "triangulate" data – using combinations of two or more data sources (such as pre/post surveys and teacher interviews) to corroborate and confirm results and findings and to increase the accuracy of the evaluation. Whether the researcher is in the developmental stage of their EHSIC project or in the implementation/dissemination phase, it is wise to involve the evaluator from the start, and to collect data that can be triangulated. In addition, participants discussed the importance of longitudinal studies of the impact of grantee projects to assess if teachers are using curricula after several years beyond the grant period (sustainability) and if students retain content knowledge. The group acknowledged that longitudinal studies are complex, time consuming, and very expensive.

Participants discussed the difficulty that many grantees have had in locating appropriate, validated evaluation instruments, especially for the wide variety of curricula that we are all developing. It was suggested that guidelines for evaluation would be beneficial. It was mentioned that NSF created a common evaluation instrument that all projects used to measure success. In so doing, NSF was able to examine the impact of the overall program. It was noted that the National Association of Health Science Education Partnerships (NAHSEP) has evaluation instruments on line. The group suggested that it would be beneficial for NIEHS to fund the development of a model for evaluating integration. Possibly:

- An NIEHS grant solicitation (or EHSIC grant supplement) to develop evaluation instruments.
- NIEHS contracting with a professional evaluation group to develop evaluation resources for EHSIC.
- NIEHS coordinating the collection and dissemination of all of our evaluation instruments (similar to the COEP Resource Center.)

Overall, participants agreed they are all collecting a large amount of evaluation data. It is important that the data be used to inform what it is about the projects that make them successful. The group recognized the need to sort out the different variables of their individual evaluations, and develop a "best practices" list for the success of EHSIC projects. This list could include curriculum development practices, pedagogical practices, and instructional practices.

The session concluded with questions about the future of the program. Participants wanted to know whether they need/want to evaluate the overall success and impact of the EHSIC initiative, and whether the results of the evaluation of individual projects and of the entire EHSIC initiative would drive the development of the next grant solicitation from NIEHS. They emphasized that the budget for evaluation needs to be increased to really provide the best analysis. The group expressed that a longitudinal study would really be the best way to examine the impact of integrative education. It was noted that analysis of EHSIC will be challenging because of the different strategies employed by the nine projects – was it ES? Was it teacher development? Was it the model? What was the contributing factor?

It was suggested that evaluation focus on impact on teacher behavior and beliefs. As demonstrated by data from OSU, if teachers understand the concepts and are able to teach it well to the students, the students' performance will improve. Therefore, student performance is really a measure of teacher ability. It was suggested that another measure of success is the size of the student pipeline.

4th Annual Environmental Health Science Colloquium

This special event is an opportunity for students participating in Project EXCITE to present the findings/results of their environmental health science investigations. During this evening long share-a-thon, student teams exhibit and discuss poster presentations to small groups of audience participants. Projects are not judged. The Colloquium is held at COSI, Toledo's local science center, and is attended by parents, community partners, students, teachers, school administrators, and project staff.

EHSIC participants interacted with the students and teachers to learn more about the student projects.

EHSIC members were impressed by the level of sophistication of some projects and the overall enthusiasm of all students. It was clear for the brief interactions with students that they really possessed a better understanding of environmental health and problem solving. At the end of the evening EHSIC participants explored the museum and enjoyed its exhibits.

National Conferences

Laura Hemminger pulled together a list of national conferences that the EHSIC grantees could target for 2005-2006. David said that he would lead a group for the submission of a proposal to the AERA conference that will be in San Francisco, CA in April 2006. After the conference Jodi volunteered to lead a group in the submission of a proposal to the Hawaii Education conference. All interested projects should follow up with these two leaders.

Discussion Forum

Vince has created an on-line discussion forum for the EHSIC grantees. This mechanism will allow grantees to maintain discussion threads without clogging their in-boxes. He will send information to project leads on how to access the forum.

Wrap-up/Key points

The following points I distilled from comments and presentations during the day and one-half session.

1. Make teachers feel sense of ownership
   Several projects mentioned that when teachers were involved in the process of developing curriculum or modifying it, they were more receptive to implementing it in the classroom.
2. Highlight benefits of integration
   Once you show that integration does not harm student performance, projects need to emphasize to teachers and administrators the positive impacts of using integrative curricula.
3. Define 'environmental health'
   We need to do a better job of explaining what environmental health is and how it is different from ecology and environmental studies. Highlight its natural interdisciplinary nature.
4. State departments of education need to see academic performance
   At the end of the day, state departments of education need to see a positive impact on student performance before they will support new curricula.
5. Student performance and ownership
   Projects explained that there is anecdotal evidence that when students have a sense of ownership in classroom activities their academic performance increases.
6. Special needs students (ESL, low-performing, etc)
   Projects demonstrate that integrative curriculum has a positive impact on special needs students.
7. Environmental justice and social responsibility
   A few of the projects show the importance of incorporating these components into the curriculum.
8. Best practices
   We need to highlight these practices and make the education community aware of them.
9. Core concepts/environmental health standards
   There are a couple of projects that are working on developing these.
10. Common evaluation instruments
    There is a need for this. In addition it would benefit the EHSIC program as all projects would use the same criteria to evaluate their activities.