

## 6. Operational Models

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### *Staff Development*

Our staff development philosophy is to move theory and best practice into the classroom. The fundamental concept involves needs assessment and teacher self-assessment as priorities (see Figure 1). We believe in a holistic program, rather than disjointed “sessions.” And although we did structure events as workshops, workshop series, classes, or workshop clusters, they were learning action events, not stand-alone, and they ranged in types of activity. Our program provided a fabric of interwoven events.

We preferred leading others to lead themselves, rather than just serving as topical consultants. We believed in using “local” talent, knowledge, experience, and expertise whenever possible, especially when moving a grant-funded initiative toward sustainability. After self-assessment and needs assessment were concluded and compared, a program was confirmed and aligned, changed or built, based upon them. Teacher teams established their beliefs and values, created visions for themselves and their students, and identified their goals, basing them on what they perceived as current realities. They identified desired results; then together we analyzed the program and project to identify which program components could help them accomplish their goals. Their goals might relate to the development of interdisciplinary curricula, choice of new teaching models, development of assessment procedures and partnerships, and others. Teachers learned about new research and practices, and they then moved toward applying what they learned in the classroom.

The program, although usually already planned based upon the initial needs assessment, could be revised to accommodate what was learned in the self-assessments. Teachers were not passive participants in our process; they were involved in making content and process decisions, and they agreed to standards or criteria of involvement. The teachers and teacher teams engaged in individual and collective learning as well as leadership (Beavers, 2001; Collinson, 2000; Cozart & Gerstl-Pepin, 2002; Finch, 1999; Fuchs & Fuchs, 2001; Jones & Holder, 2001; Sanborn, 2002; Sparks, 1997; Terehoff, 2002).

All of our endeavors involved interdisciplinary teaching teams, which created an exciting context for sharing. Where it was not possible to continue a team or build a team, we supported individual teachers who desired to achieve the program goals. The ultimate goal was to have everyone involved in the program, so that when team members transitioned across schools within a district, all had been trained and members of teams and could, therefore, join existing teams in their new schools. To ensure the development of deeper and more meaningful relationships, we preferred to engage with schools, districts, or teaching teams for longer periods of time (Birman et al., 2000; Keifer-Barone & Ware, 2002; Peterson, 2002).

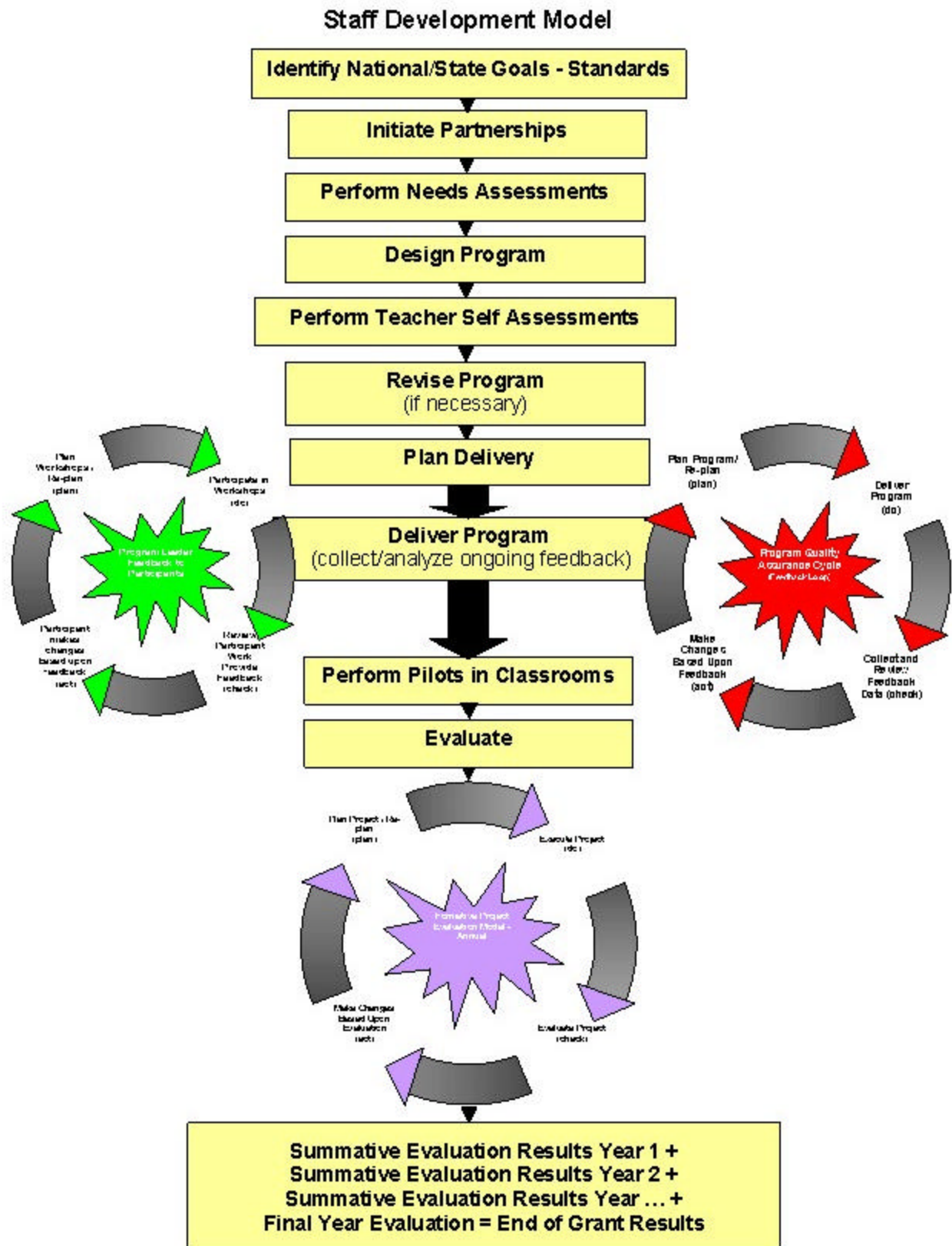


Figure 6.1 Staff Development Model

### *National Staff Development Standards*

Our model has evolved since 1983, with fundamental components, processes, and philosophies that appeared “before their time.” When we began our work, we had to justify why funding agencies should provide support beyond “program offerings,” and why we wanted to follow teachers into the classroom to pilot their educational product or process. As national thinking about project evaluation began to change and include requiring classroom pilot and student achievement data upon which to base evaluation, we found it easier to seek funding. The action research movement has helped a great deal. Today, there is a plethora of literature upon which to base good staff development practice.

Our philosophies, strategies, and results support what is now regarded as best practice, addressing some of the critical questions in designing staff development programs. Readers should consult the National Staff Development Council’s (NSDC) (2001) standards for staff development. The NSDC also provides a Standards Self Assessment to assist a district in determining staff development strengths and areas that need improvement.

Hirsh (2000, p. 50) elaborates the NSDC standards and lays out the following criteria for exemplary staff development, specifying: “results measurable in terms of student performance; a well-defined process that enables others to replicate learning; content-specific staff development designed to improve teachers’ content knowledge and pedagogical skills; and, involvement of multiple schools, within or across districts, a state, or region.” Hirsh (p. 51) poses important questions about the criteria:

1. *Content:* Is there evidence, in terms of student results, that proves an investment in this content will produce the desired results.... [H]ow well is the content aligned with standards for student learning? Is the program designed to improve teachers’ content knowledge and pedagogical skills? Does the program embed the pedagogy in the content and enable teachers to make successful transitions into their daily practice?
2. *Process:* How well does the program address the national standards for professional development? Is enough information and support provided for the program to guide successful implementation? Does the program provide a means for collecting ongoing data to monitor its impact? Are there student measures of success to determine the impact of the program (e.g. student portfolios, pre-testing and post-testing, student writing samples)?
3. *Context:* Do the program developers or providers have evidence of its application in a school with similar demographics and needs? Will the program produce results similar to the results it has produced in other schools? Do you have the necessary resources, including time to ensure the program is implemented as recommended? Are the leaders sufficiently knowledgeable and invested in the successful implementation of the program?

The NSDC standards and Hirsh’s questions appeared after we had almost completed our initiatives, but it is always important to benchmark one’s endeavors against current standards. In doing so, we find that our programs and models measured up very well and that we met the three

categories of professional development standards. In the following enumeration, italic type highlights those categories in which our programs excelled.

1. Content Standards – Staff development that improves the learning of all students:
  - *Prepares educators to understand and appreciate all students; creates safe, orderly, and supportive learning environments; and holds high expectations for their academic achievement. (Equity)*
  - *Deepens educators' content knowledge, provides them with research-based instructional strategies to assist students in meeting rigorous academic standards and prepares them to use various types of classroom assessments appropriately. (Quality Teaching)*
  - Provides educators with knowledge and skills to involve families and other stakeholders appropriately. (Family Involvement) *(In our PHYS-MA-TECH initiative, we did seek approval from and inform parents about the goals of the initiative. Also, we surveyed parents about their children's reactions to the program. In the other initiatives, we were not involved with parents. However, we were very involved with business, industry, and community organizations as they delivered critical components of the program and then continued as partners during the modules.)*
  
2. Process Standards – Staff development that improves the learning of all students:
  - *Uses disaggregated student data to determine adult learning priorities, monitors progress, and helps sustain continuous improvement. (Data-Driven)*
  - *Prepares educators to apply research to decision making. (Research-Based)* (We engaged teachers in what today might be termed action research. They used pretests and posttests to determine student achievement. In our initiatives, these were formal, quasi-experimental pilots with researchers guiding the process. The tests were either adopted from national organizations or developed by teachers with the assistance of the project research associate. By engaging in the formal pilots, teachers began to see a direct connection between what they taught, how they taught, and how they designed learning opportunities, and they could understand that they must design carefully any assessment instrument, process, or procedure.)
  - *Uses multiple sources of information to guide improvement and demonstrate its impact. (Evaluation)*
  - *Uses learning strategies appropriate to the intended goal. (Design)*
  - *Applies knowledge about human learning and change. (Learning)*
  - *Provides educators with the knowledge and skills to collaborate. (Collaboration)*
  
3. Context Standards – Staff development that improves the learning of all students:
  - *Organizes adults into learning communities whose goals are aligned with those of the school and district. (Learning Communities)*
  - Requires skillful school and district leaders who guide continuous instructional improvement. (Leadership) (In some initiatives, we worked directly with principals

through workshops, discussion sessions, and opportunities for them to collaborate across schools about what their teachers are doing. This was possible in all of our initiatives, except Rockford.)

- *Requires resources to support adult learning and collaboration. (Resources)*

Additional literature supports our process. For example, Rhoton and Bowers (2001), in *Professional Development Leadership and the Diverse Learner: Issues in Science Education*, explore most of the major topics important to today's science education reform and can be used more broadly when considering staff development program and process issues. Since science is one of the critical disciplines to all of our initiatives, this source is quite valuable for reference. It confirms our approach to content and process. Also available is *Advancing Excellence in Technological Literacy* (2003) which presents staff development standards for technological literacy.

We asked similar questions when working with administrators and teachers and expected them to identify their individual and team goals for change. We engaged them in an assessment-oriented self-analysis in which they identified their strengths, growth goals, and areas where they wanted to learn more. This process focused on establishing the "reality" of where they were, a vision of where they wanted to be, and a plan for achieving their vision, using the components as part of their action plan.

Lipka and Brinthaupt (1999), in *The Role of Self in Teacher Development*, address teacher understanding and acceptance of self as critical. When teachers build their knowledge and skills, they gain in self-esteem and self-confidence as professionals, becoming personally more secure and more open to relationships with others in their learning community.

Hamachek (as cited in Lipka and Brinthaupt, 1999, pp. 207-208), identifies behavioral descriptors for good or effective teachers:

1. They are inclined to combine warm and friendly attitudes with firm, but reasonable, expectations.
2. They project an enthusiasm for their work that lends excitement to their teaching.
3. They are by no means perfect, in the sense of doing and saying just the right thing at all times.
4. Intellectually they are thoroughly grounded in their subject area, which, by virtue of a broad base of interests, they are able to connect to related areas of knowledge.
5. They are ready to assume responsibility for student outcomes, which they reflect in their efforts to make sure that all students have a chance to learn.
6. They make it a point to know their students as individuals and to respond to them as individuals; they go beyond simply seeing them as "students."
7. They provide definite study guidelines; they are as interested in getting their students prepared to know as they are in evaluating what they know.
8. They are able to challenge without being offensive and to encourage without being condescending; more importantly, they challenge when appropriate, and they encourage when needed. No behavior is indiscriminately practiced.

9. They give feedback that is personalized, an effect that makes the feedback more believable and powerful.
10. They take time to reflect about their work, their students, and themselves as teachers; they are, in a word, thoughtful.
11. They work on developing a positive rapport that serves as the interpersonal medium within which high, but reasonable, expectations and constructive, critical feedback can be transmitted.
12. They are able to be flexibly adaptive in terms of using direct or indirect methods of teaching to meet various student abilities and needs.

The individuals we selected to be program leaders usually exhibited these attitudes and behaviors as well as the knowledge and skills required. In our initiatives, caring was critical. We worked with large groups of teachers we might identify as insecure, lacking confidence, or uncomfortable in their roles or responsibilities. We “cared” about them as people first and then worked with them to build or strengthen their knowledge and skills, confidence, and self-esteem. Modeling went far to establish the expectations of a caring environment. It moved the group toward becoming a true “learning circle [community],” as discussed by Collay et al. (1998), in which six conditions begin to be realized: building community, constructing knowledge, supporting learning, documenting reflection, assessing expectations, and changing cultures (p. x). Ultimately, we wanted participants to find an environment where they realized that:

- There are a number of well-developed models of teaching and curriculum that generate substantially higher levels of student learning than do normative practices.
- The most effective curricular and teaching patterns induce students to construct knowledge – to inquire into subject areas intensively. The result is to increase student capacity to learn and work smarter.
- The most effective models of curriculum and teaching increase learning capacity for all students, greatly reducing the effects of gender, socioeconomic status, linguistic background, and learning styles as factors of student learning. (Hopkins et al., 2000, p. 5)

These authors, and others we could cite, discuss a framework for teaching and learning that revolves around behaviors, skills, relationships, and models. They confirm our content, strategies, and processes and further inform us for future endeavors. Also, they are in sync with *Models of Teaching* (Joyce & Weil, 1995), which we used as a primary resource for the teaching models component.

### *Objectives*

One of our goals was to provide a holistic program with integrated deliverables, both product and process. Several objectives kept us focused on the quality of the program:

- Our *first objective* was to base our activities on the most recent research and information. In many cases, we were teaching new, or revisited, concepts, skills, and models before they became a national focus or best practice.
- Our *second objective* was to do as we asked others to do. We held ourselves accountable to formally model the best practices, models, techniques, procedures, and processes as workshop leaders. The lead team that worked with me for the longest period of time accomplished that very well. For example, our workshops set objectives and standards, and we used rubrics to inform the teachers about what was expected and to score what they developed. They scored their product (with incorporated processes), and then we scored it using the same rubrics.
- The *third objective* was to create an integrated program that was logically sequenced to accomplish the participants' learning and development goals. The program needed to be integrated in content and sequence, and also in how and when particular components of the products, performances, or processes were learned and developed or, in some cases, simply incorporated. Therefore, we usually chose an "umbrella" culminating product: the integrated, interdisciplinary curriculum module (IICM). The design and components for this module integrated new strategies, processes, procedures, models, and techniques that teachers were supposed to use during a formal pilot. The IICM promoted the integration of MSTE and also required the integration of new strategies, processes, models, techniques, and procedures. It was both content *and* process.
- A *fourth objective* supported piloting. We followed the teachers into the classrooms as they piloted the modules. We prepared them for data collection and feedback; a program leader helped the teachers set up their pilots, meaning that the teams established clearly what they wanted to learn as teachers. The modules provided the necessary information about the goals for students, but a critical piloting concept was that teachers themselves should have goals or identified targets of change. The teachers met with a program leader to identify their personal professional goals and what they were going to try that was new; after the pilots, they met with the same individual to debrief about the outcomes. They were observed at least once by an external observer, sometimes more often, and sometimes by a peer or several peers. Immediately after the observation, they met for feedback, and after the pilot, they met to determine what worked and what should be changed.
- Finally, a *fifth objective* was to set the stage for networking both within and across schools and across teachers and teacher teams. Networking reinforced and extended teacher learning, especially after pilots. For several years we were able to get teachers to meet mid-year and at the end of the year to review what they learned during their pilots. I cannot speak highly enough about the value of "group study" for enabling teachers to validate one another's experiences, reinforcing good results, and engaging together to determine what they should try next. Most of what worked is described in the workshop

chapters (see Part II), and what did not work, usually, did not because the teachers lacked the infrastructure, leadership support, individual commitment, or simply did not follow through.

### *Facility*

We tried to avoid working in school buildings, and sometimes even district staff development spaces, because we regarded them as less professional spaces that affected how teachers responded psychologically. We preferred space that was set up for professional conferencing and with technological capabilities because it transformed the “psyche” of the teachers and improved their motivation, productivity, and engagement. The “space” greatly affects their sense of value and professional.

Our views on space led us to use different models. When working with a district, as we were in Rockford, we had no choice but to go to Rockford. However, we tried to find a conference space, and in Rockford we held most meetings at a conference hotel and restaurant. Typically, this would have been too expensive, but the facility owner worked with us to keep within our budget. One might ask why we did not prefer a university or community college space. We did extend to the community college space and the university center located in Rockford. We also transported teachers from Rockford to the main university campus, about 40 minutes away. However, it is important to acknowledge the issues in accessing college or university space appropriate for conferences. Frankly, they have become profit centers and invariably give priority to outside clients rather than university-sponsored projects and events, and they are now expensive.

### *Time of year and day*

Our teachers differed greatly in the time they devoted to our basic program, from as few as 19-20 days to more if they added electives. The advanced-level groups scheduled as many as 30+ days with us for a one-year cycle. To accommodate those choices and to give teachers a much needed and deserved break during the summer, we used various combinations:

- a. weekday school holidays
- b. weekdays, as a local in-kind school match, using substitute teachers for those days
- c. local district institute or teacher work days
- d. Saturdays
- e. spring breaks
- f. Christmas breaks
- g. summer, after school ends and before it begins
- h. evenings, after school
- i. combinations of the above
- j. on their own, a model that just does not work

The time of day has also varied:

- a. 8:00 a.m.-5:00 p.m., a common model
- b. 8:00 a.m.-4:00 p.m., a model we now use
- c. 4:00 p.m.-9:00 p.m., after school, a model we have left behind
- d. 8:00 a.m.-12:00 p.m., a model we do not use very often
- e. on their own, a model that does not work

My preference was the 8:00-5:00 model, with an hour for lunch and breaks. However, many of my colleagues preferred the 8:00-4:00 model with an hour for lunch. Teachers were mixed about it as well. Although many were ready to end by 4:00 and admitted to being drained, some felt rushed and preferred 5:00, especially when working together and being supported. Teachers who are immersed in development and learning activities seldom realize what time it is. Though tired at the end of the day, they will be elated and enthusiastic about their accomplishments, especially when they are going to use their new products and strategies in the classroom.

A progressive program over the majority of the school year and into the summer, until approximately the end of June, worked best. It allowed “digestion” time between sessions, and many of the teachers actually worked on projects between sessions. It also allowed teachers to be free for vacations from July 1 to mid-August when school began. We preferred, however, to have them meet with us in mid-August to review the piloting strategies, data collection responsibilities, and meeting dates before they began piloting activities.

The best model was to meet with the teachers early in the fall semester for orientation and begin the first sessions no later than October, for an extended and holistic program.

### *Options for Place, Facility, and Time*

#### *On-campus extended conference (my favorite)*

So far, only the “in-district” model of delivery has been discussed. Others were also successful. When working with a regional group of schools, teachers, or teacher teams, we had them come to campus for up to six weeks at a time, for the development activities, and housed them at the student center or a local hotel close to campus, the library, departmental laboratories, and computer access. This was probably the most exciting model. When teachers were on campus, away from their own contexts so they could not easily be disturbed or distracted, they immersed themselves in a very different way. Their enthusiasm, commitment, productivity, professional and personal growth, and interest in exploration and learning grew. When they stayed overnight, the learning, networking, and development lasted well into the evenings. We truly became the invisible support system and they began leading themselves, developing strong relationships with each other. Given the resources, most teachers who had a week with us on campus would choose this model over being located directly in the district. It also permitted frequent access to professorial support for shorter time periods because they could come and go as needed.

### *Alternative version of on-campus conference*

In addition to the current program and the on-campus model for use when all teachers were engaged in the same program, there were others. The alternative version of the on-campus model was campus-based, of course, and could use some of the same program content, but it also provided for flexibility of participant concentration. For example, in working with some districts, most of the teacher teams focused on particular common goals (e.g., developing interdisciplinary teaching teams, learning to develop authentic or performance-based assessment, or adding alternative teaching models), but others had somewhat different goals or needs. In those situations, we organized programs so that the whole group of 80-150 teachers could engage in experiential learning together in the mornings and at the end of the day, but during the interim they engaged in experiences more directly related to interests or needs of their particular teams. This aspect of the program could differ by focusing on new teaching strategies that other teams might not feel the need for or by reinforcing or building skills where they did not feel as confident. Or each team might have different real-world needs and arrange its schedule to meet with separate industry representatives or visit different industries, laboratories, or community sites. Yet another variant was to schedule all participants together for half the day and then send them into their team-specific programs for the second half of the day.

These arrangements worked well, especially when teachers reconvened later in the day. The networking between groups often promoted interaction; the teams shared their experiences so that the others learned vicariously.

### *Teachers respond to. . .*

Teachers actually worked more than the seven or eight hours a day discussed above, but there was never a discussion about hourly compensation in these settings. A key facility aspect of the on-campus model and its optional version is the importance of having particular rooms, labs, technology, and media available. Teachers need to be able to interrupt their work and go somewhere to try out a theory or technique. They need space to arrange particular types of shared resources and rooms for breakout groups, brainstorming, or videotaping themselves. Regardless of whether in-district or on campus overnight, teachers need to be in spaces where they could safely leave their work-in-progress and not have to unpack it each morning. Not having to lug things around each day and lose hours to packing and unpacking makes a major difference in their intellectual flow, productivity, level of engagement, enthusiasm, and excitement. When the environment, climate, and facility come together in the right configuration, teachers produce at amazing speed with extraordinary intellectual rigor and quality.

### *On their own (We refuse to do this ever again!)*

This did not work for most teacher participants, regardless of ability. The few times that we tried letting teachers take a major piece of work home over the summer were not successful, in that most of them accomplished very little or work of less quality. A few exceptional individuals did finish high-quality products, even when they worked at home. However, they are

the ones who put time and effort into their products, followed our guidelines, and called for assistance when they needed it.

One example of on-their-own lack of productivity occurred because the district and the local teachers union determined that teachers could only participate in additional work for two weeks after school was out and for two weeks before school began and that staff development over the summer was not to go beyond this time period without special approval. The district director convinced the project team to let teachers develop their modules at home between those times. The lead project team, against its better judgment, agreed. Some of the program occurred throughout the school year and for those two weeks after school ended and before school began. We did convince the district director, however, to let us offer several days when we would be available for teachers to seek in-person assistance.

When the teachers returned to us in August, most of the work was incomplete, even though the curriculum format and rubric were clear and detailed and had been explained to the teachers before they left for the summer. When the teachers realized that their work was not completed, they panicked and began to assume that they would not get their stipend (in fact, union regulations would have compelled us to give the stipend, and it is not our policy to withhold money as punishment or use it to motivate). The teachers refused to participate in the program planned for certain days because they wanted to finish their modules during that time. We managed to get each team to the completion point by changing the August program, but it was a difficult time. The lead team declared it would never again compromise the integrity of the approach by agreeing to the unsupported work by teachers “on their own.” More importantly, we set the teachers up to perform less well than they would have with support, and frankly, they received two stipends for the same product. They also lost new program content, since they completed their modules during time planned for the new program components.

### *Development Based on Performance and Results*

Our professional development program was based on performance and results. Teacher teams focused on creating or acquiring products, processes, models, strategies, and procedures that would lead to improved student learning and performance. The teachers only really began to grasp the concept of continuous improvement if they returned for additional program levels. As they advanced in the program – at each level designing, selecting, or developing new products or processes, and then piloting them in the classroom, while continuing the efforts that they had already piloted and modified – they began to realize how much they could accomplish when their efforts were continuous (Bernauer, 2002; Birman et al., 2000; Burke, 1997; Burke, 2000; Magestro & Stanford-Blair, 2000; Markowitz & Whittaker, 1999; O’Very, 1999).

Our philosophy requires experimentation in the classroom. Teachers have to commit to classroom pilots with observation and feedback for each level of program participation. They become very excited and return for more because we engage them in developing real products and processes to transfer directly into the classroom. When we were able to provide professional space, materials, technology, a “program” of learning, opportunity for collaboration, and multiple levels of learning, most teachers would engage in their own development, begin building their own bridges between sessions for their own purposes, and literally sign up for all

or almost everything offered, all on their own. We considered ourselves only one factor in the resource formula (Gatlin, 2002; Grace, 1999; Hillkirk et al., 1997; McKenna, 1998).

### *Feedback*

Feedback from the program leader and peer participants is vital for our staff development approach. Each teacher or team, and sometimes both individual team members and the team itself, received a great deal of feedback on products or processes (Figures 5, 6, and 7). Participants also provided ongoing feedback about the program content and process, and they evaluated it holistically at the end of each year.

### *Pilots*

The key to success lay in our requirement of moving from the program into the classroom with direct observation and feedback because that requirement built application and practice into staff development. Many, if not most, traditional staff development models are involved primarily with the “imparting” of new information, knowledge, or skills and do not include classroom application or practice as an integral aspect. We, on the other hand, considered the pilot an integral part of staff development. Current research and best practice now encourage this approach, which we have been using since 1989.

Learning that resulted in the application of theory and piloting of new educational products and strategies in the classroom is the best type of staff development. Teams begin to need less time outside the classroom to prepare to do something new; they communicated, strategized briefly, and took action with the students. Optimally, the teacher team members and their students began to adopt a “let’s try it” model of operation (Birman et al., 2000; Dufour, 2000; Hirsh, 2000a; Hirsh, 2000b; Senese, 2002).

### *Teaching Portfolios*

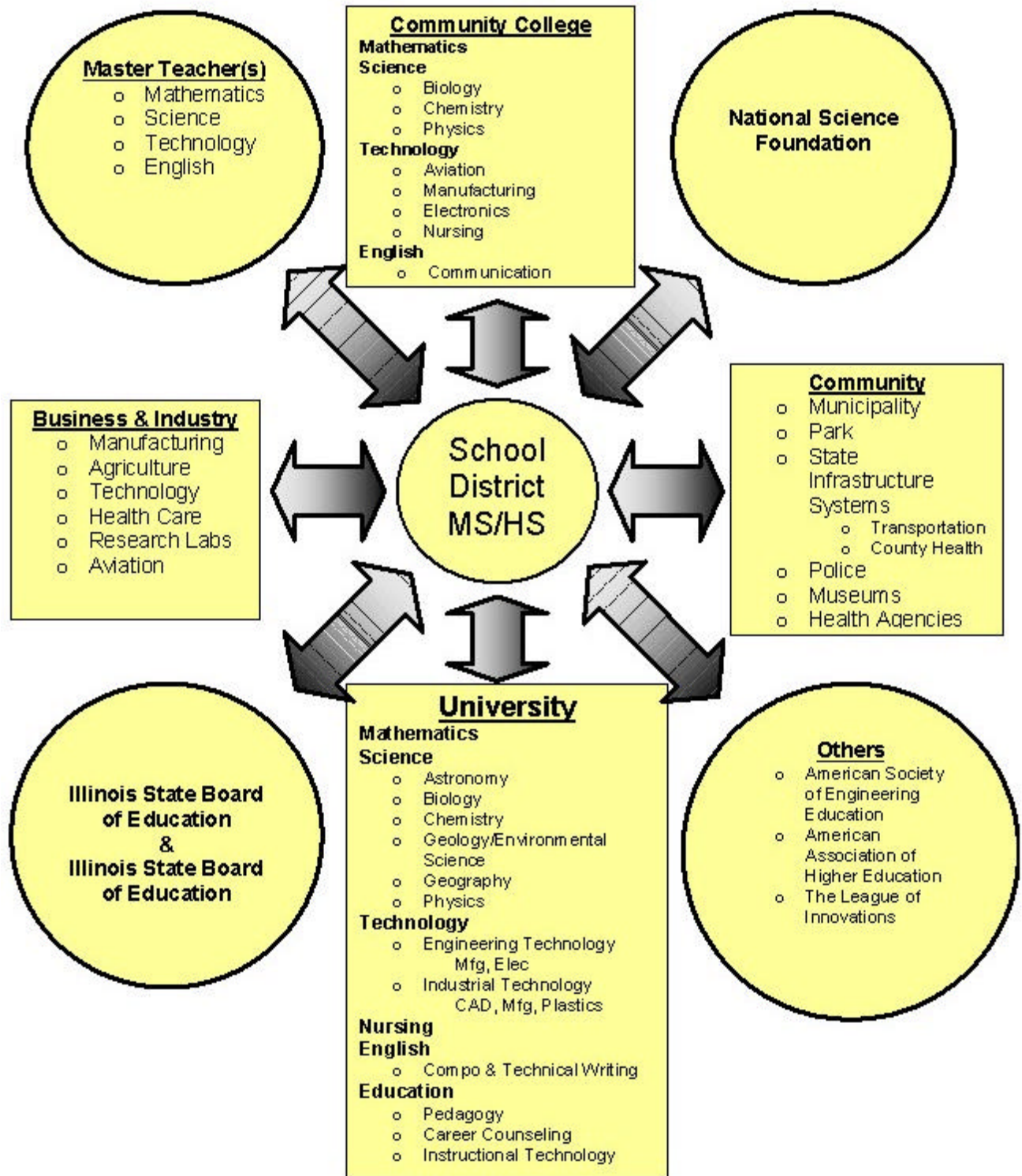
Teaching portfolios work well for documenting professional growth and engaging teachers in ongoing self-assessment. We engaged teachers in informal portfolio development for particular clusters of learning events, using journaling for reflection. However, the interdisciplinary MSTE curriculum modules, content and process in nature, served as “formal” portfolios of a kind because they included the new models, strategies, procedures, and techniques. Therefore, although we did not label them portfolios per se, the modules could easily serve as documentation of what the teachers had learned and their piloting process. Finally, the teachers used them to assess where they were professionally and what they wanted to learn about and try next (Riggs & Sandlin, 2000).

### *Partnership Model*

The partnership model (Figure 2) identifies both internal and external partners. Although our project was led by NIU's Department of Technology, various major contributions made it successful not only as a grant-funded project but as an initiative. NIU and Rock Valley College (RVC) provided personnel, matching funds, and in-kind services. RPS contributed matching funds and in-kind services and matched resources with computer technology and training for

teachers. Some teachers had already been supplied with technology by the Illinois State Board of Education (ISBE) and Illinois Board of Higher Education (IBHE) partners in their support of the pilot grants prior to the NSF-funded project. Regional or state BIC organizations provided personnel, on-site development, and personnel partners to work in the classrooms, and some provided direct support of materials, supplies, or field trips for students. This initiative actively involved approximately 300 BIC organizations, more than 300 teachers, approximately 50 higher-education professors, and a variety of other individuals such as master secondary teachers, one master teacher leader from another district, and special consultants.

## Internal & External Partners



**Figure 6.2 Internal and External Partners**

## *Project Partners*

### **Organizational Partners**

Northern Illinois University; Rockford Public Schools; Rock Valley College; Illinois State Board of Education; National Science Foundation; Illinois Board of Higher Education; Private business and industry; Community, regional, or state organizations; Gray's Lake Community High; The League of Innovations; American Society for Engineering Education; American Association for Higher Education

### **Internal RVC Partners**

*Academics:* Dean's Office, Mathematics, Science, English

*Center for Technology:* Director's Office, Electronics, Aviation, Health, Manufacturing

### **Internal NIU Partners**

*College of Engineering and Engineering Technology (lead organization):* Dean's Office, Engineering, Engineering Technology, Industrial Technology

*College of Liberal Arts and Sciences:* Dean's Office, Mathematics, Biology, Chemistry, Physics, Geology/Environmental Sciences, Geography, English, University Writing Center

*College of Education:* Dean's Office, Instructional Technology, Kinesiology and Physical Education, Counseling

*NIU:* Vice President of Research and Dean of Graduate School's Office; Provost's Office; President's Office - Outreach Division

*NIU Departments with Specialties:* Sponsored Projects, Grants Fiscal Administration, Accounting and Procurement, Public Affairs

## *Program Model, Parts I and II*

The Staff Development Model is discussed below, first with a brief description of program components and again graphically.

Figure 3 shows the basic program (Part I) and Figure 4 the advanced program (Part II). Most of the conceptual components transcend time. In other words, teachers would need to continue professional development on these topics regardless of what year it was or to what state the technology had evolved. There would always be a need to provide development on topics such as technology, articulation, communities of practice, partnership development, student performance strategies and procedures, and teaching models. (For more information on each workshop, read the general workshop component sections, starting with *Program Scope*,

*Content, and Sequence*, in the next chapter, as well as the specific workshop descriptions in Part II, where particular program components are presented more fully.)

The program was offered in a variety of ways; however, the sequence presented is based upon what was successful most recently and also upon what we learned. It is suggested as a logical and somewhat constructivist approach to meeting teachers' needs and desires in the conceptual areas. Also important is the concurrency of the many learning activities. Because of the program's complexity, it was impossible to offer it as a pure sequence. The basic program is almost sequential, but when teachers choose to participate in elective offerings, they may be involved in activities concurrently, where one program component begins its series over four weeks and another one also has offerings during that time. The basic program had a set of requirements that anyone beginning with the initiative must complete and offered fewer elective options. The conceptual model will be briefly explained; for more information go to the full program description in Chapter 7.

### *Basic Program (Figure 3)*

The basic program began with an *orientation* that described the program, requirements, schedule, expectations for the teachers, and reward structure. The second required session was training on *technology*, based upon individual needs. This training could be ongoing while participants began the first content session on *articulation*, which involved both community college and university faculty and focused on helping teachers understand the requirements for admission to college and university programs. There was usually a set of BIC panels, sometimes by sectors, sometimes mixed, so that teachers got a feel for what employers were expecting and what the educational requirements were for particular entrance points to jobs and careers. The program component included visits to community college and university campuses for discipline-specific workshops on *educational pathways to careers* that provided a more in-depth look at educational requirements or foundations for an array of careers.

Teachers were prepared to become *interdisciplinary MSTE teaching teams*, so they could understand what formal teaming entailed and also prepare their team organization and process. This was where they developed their vision for themselves as teachers. Participants were then ready to learn about their culminating product, the interdisciplinary and integrated curriculum module (IICM). They received the format and rubric and a full explanation to guide them throughout their entire program as they built the IICM. On their first day of *module development*, they reviewed Bloom's Taxonomy and Dale's Cone of Learning, chose standards upon which they wanted to base the module, made their BIC connections, and wrote the module introductions.

Next, participants spent a day on teaching foundations, focusing on brain research, multiple intelligences, learning styles, and teaching expectations and student achievement (TESA). They began their *BIC visitations* and participated in *discipline updates*. Once these updates and visitations took place, they worked with a program leader on *student performance assessment*: designing and developing more authentic performance tasks and rubrics and improving their traditional tests by developing a pretest and posttest for their module, with a new understanding that student assessments should be based upon standards and be developed before they completed the more contextual and instructional-related aspects of the module.

The module was much more than merely curriculum content; it also documented the teaching and learning process and the “how” and “to what levels” they were going to teach and students were to learn. Although we decided that instructional technology was probably best taught at the beginning, gradually progressing throughout the program as teachers developed the modules, we found that that strategy worked much better for the advanced program, where teachers already had the basic foundation. In the basic program, the instructional technology sessions occurred throughout, usually more toward the last half of the program, and the participants also learned about a variety of models that could broaden their repertoire. When the teachers *completed their modules*, during two days focused for that purpose at the very end of the basic program, they assessed the entire year’s *program* as a culminating *evaluation*.

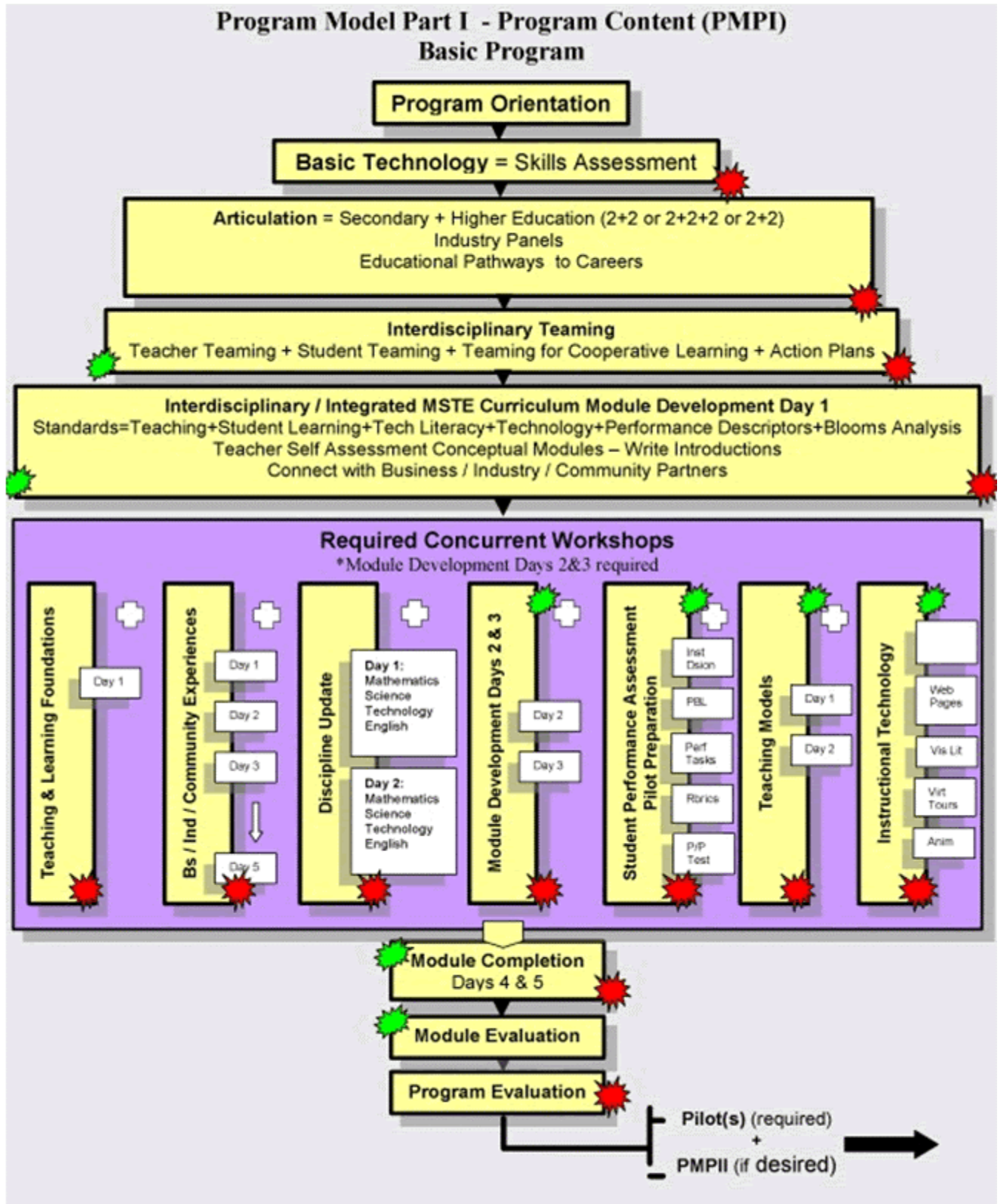


Figure 6.3 Program Model Part I – Program Content, Basic

### *Advanced Program (Figure 4)*

The advanced program offered many more *concurrent* choices because participants had greatly expanded options and fewer required areas of learning. Participants attended an *orientation* where they concentrated briefly on the requirements, expectations, schedule, and options, as well as rewards, but then focused more on getting started, for it was presumed that they understood the demands of the program. They reviewed the interdisciplinary, integrated curriculum format, rubric, and explanations, Bloom's Taxonomy, and Dale's Cone of Learning, as well as technological literacy and technology standards, performance descriptors, Bloom's analysis, and the state's student learning standards.

Later, these teachers identified which program components they would select as part of their individual programs of study. The advanced program required *orientation*, *IIMD development days 1-5*, and *BIC visitations*, as well as the *module evaluation and program evaluation* activities. Participants chose among the *concurrent workshop options*, as many as they desired, and then built their modules based upon what they learned in each event. Their second required event was the *IIMD Day 1*, when they chose learning standards, developed the module introductions, and made their BIC connections. From that point they began participating in their chosen concurrent workshop options.

The *concurrent workshop* aspect of the program had embedded within it two levels of options: first, categorical options A, B, C, and D, and then options *within* each A, B, C, and D. Thus, within the concurrent workshops were: (A) discipline-update options, (B) advanced instructional technology options, (C) theme-based interdisciplinary, integrated MSTE options, and (D) other alternatives. The advanced program could actually occur within one school year or across several school years with a more gradual approach to learning by participants. They ended the year with *module evaluation and program evaluation*, alongside those in the basic program.

## Program Model Part II – Program Content (PMP II) Advanced Program

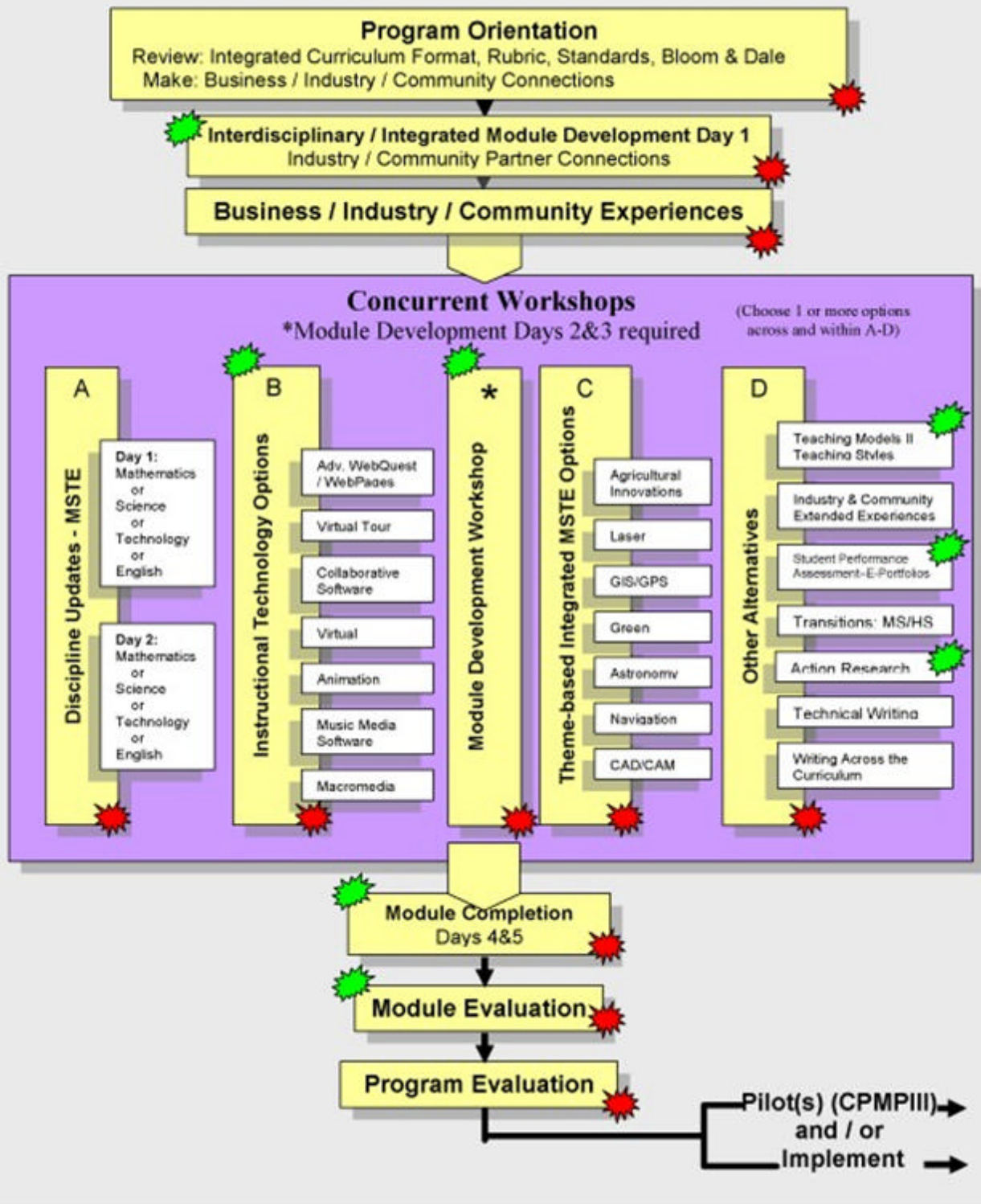
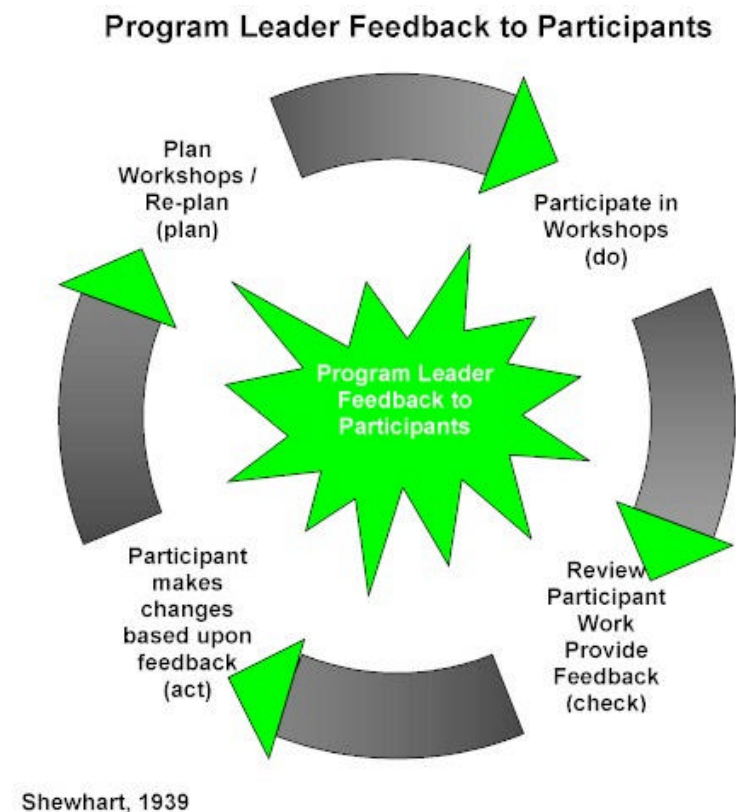


Figure 6.4 Program Model Part II – Program Content, Advanced

### *Program-Leaders-to-Participants Feedback (Figure 5)*

Green “bursts” appear at various points throughout the model graphics in Figures 3, 4, 7. These are points where the participants receive *formal* feedback on their products, choices, or perspectives. Our process was based on intensive and regular formal and informal feedback. The green bursts denote times when the feedback was more *structured and formal*.

Feedback was structured using the general strategy established by Shewhart (1939) but often described as the Deming Cycle (1986), or the PDCA Cycle (plan, do, check, act). We modified it to fit our context, but it worked well here and also for program assurance. It was a closed-loop system where teachers designed, developed, selected, or tried something new; received direct feedback from the program leaders; revised their work; and advanced to the next stage (Figure 5).

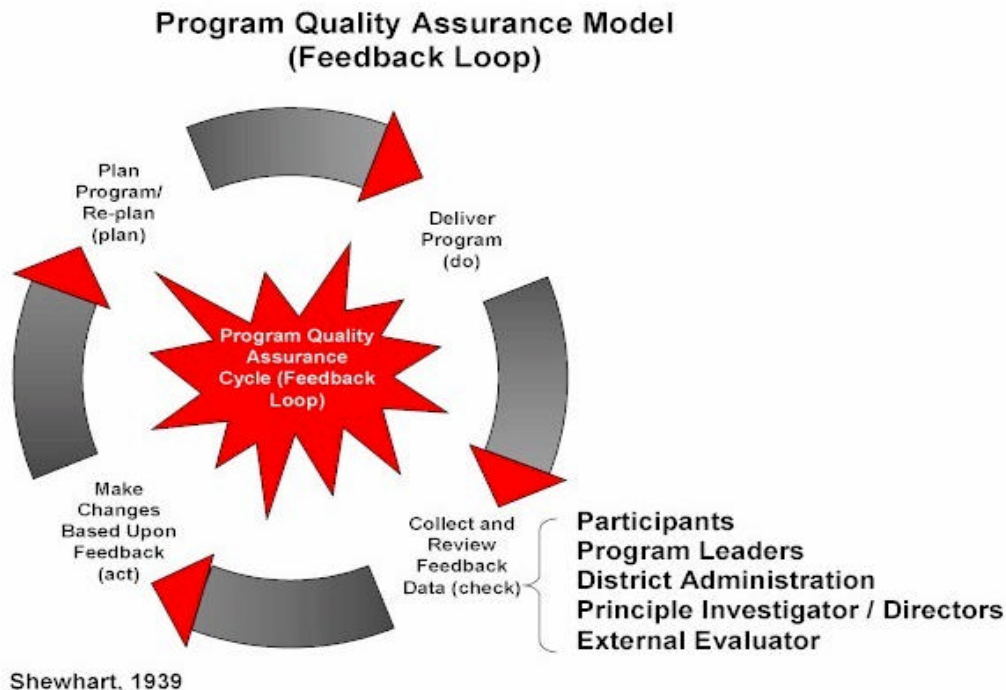


**Figure 6.5 Program Leader Feedback to Participants**

### *Program Quality Assurance (Figure 6)*

In Figures 3, 4, and 7, red “bursts” appear at particular places, which denote points where *participants provided feedback* to the principal investigator or director, the co-directors, the program leaders, and external evaluator about *program content, process, environment, and climate*. The bursts also denote points where the external evaluator (EE) could choose to visit *unannounced*. In addition to direct observation, the EE informally interviewed participants when observing many events to gain depth of insight into what they meant by their responses on the survey feedback forms completed at the end of each event.

The feedback model (Figure 6) used the general strategy established by Shewhart (1939) but often known as the Deming Cycle (1986). We modified it to fit our context. It was closed-loop in that it planned, executed, sought feedback, and used the feedback to make changes or take actions for improving the program.



**Figure 6.6 Program Quality Assurance Model (Feedback Loop)**

### *Program Pilot (Figure 7)*

All participants were required to pilot the IICMs. The model provided for a review of pilot requirements and process. Planning for the pilots began at the student assessment workshops, in which teachers developed or adapted the pretests and posttests to be used for the assessment of student achievement during the pilots. However, participants *reviewed their preparations* from the previous year to reacquaint themselves with the requirements and process. The pilot model began with that review; teachers then participated in a second session to review or reestablish their change goals. They piloted their modules as teams or individual teachers. During the pilots,

they were *observed* at least once, more if needed. They received *feedback* after that visit if possible; at the end of the entire pilot, the teacher or the whole team received feedback.

Once the team *debriefed* with the observer, the teachers *identified changes* to their modules needed to complete the final version. Finally, participants joined in a *sharing and networking session* to explore what worked and to discuss teacher and student reactions across teams and schools. Teachers went back to their schools, *finalized the modules*, and submitted them to the district (and the PI and EE). At the end of the year, they *evaluated the program*.

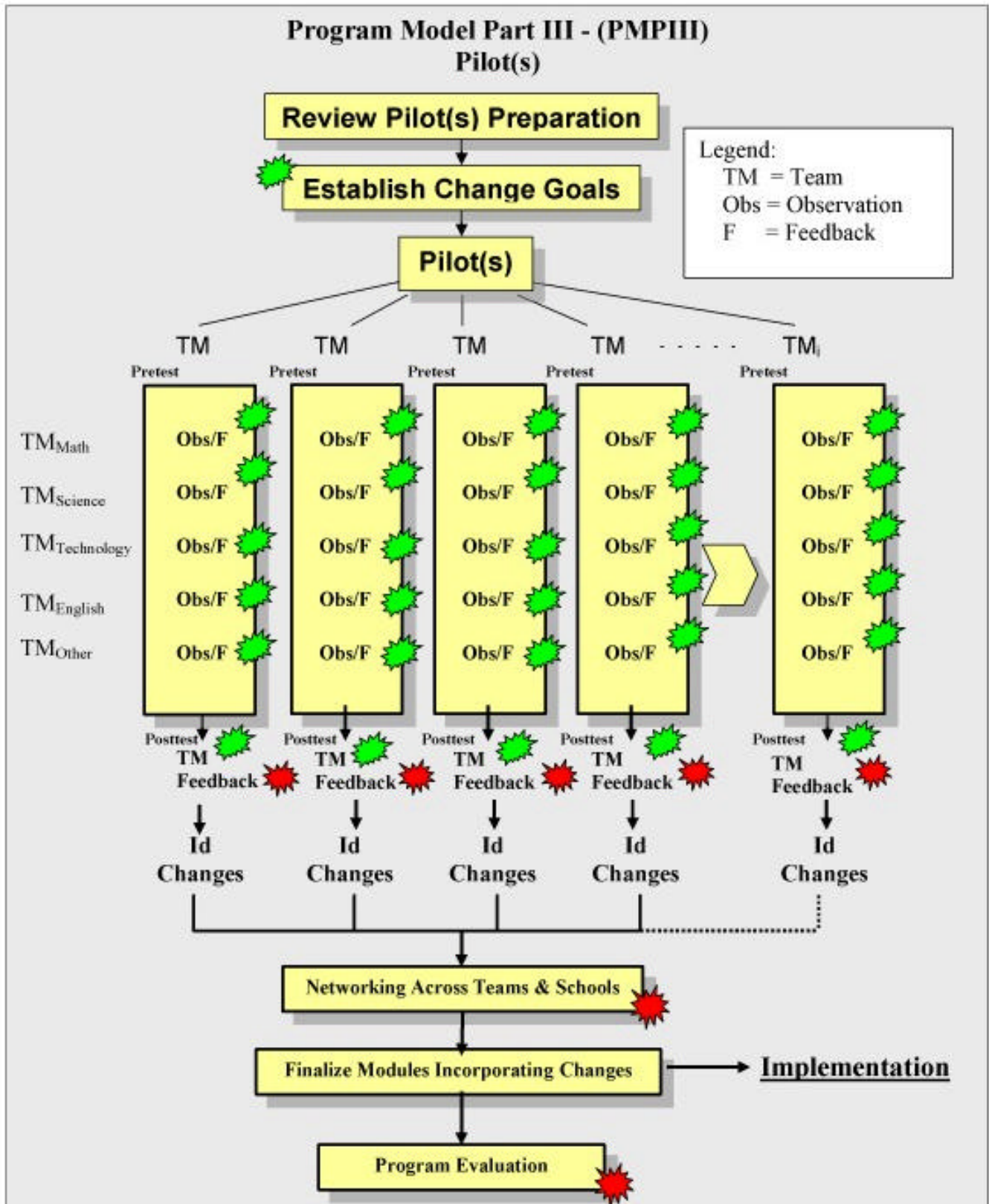


Figure 6.7 Program Model Part III – Pilot

## *Evaluation*

Both formative and summative project evaluation occurred. Formative evaluation took place each year, and summative evaluation occurred at the end of the final year (year four). Summative also occurred at the end of the third NSF-funded year (prior pilot years were funded by the Illinois State Board of Education (ISBE) and Illinois Board of Higher Education (IBHE), ending the direct work with teachers. The project extended to include a fourth year for documentation and dissemination purposes.

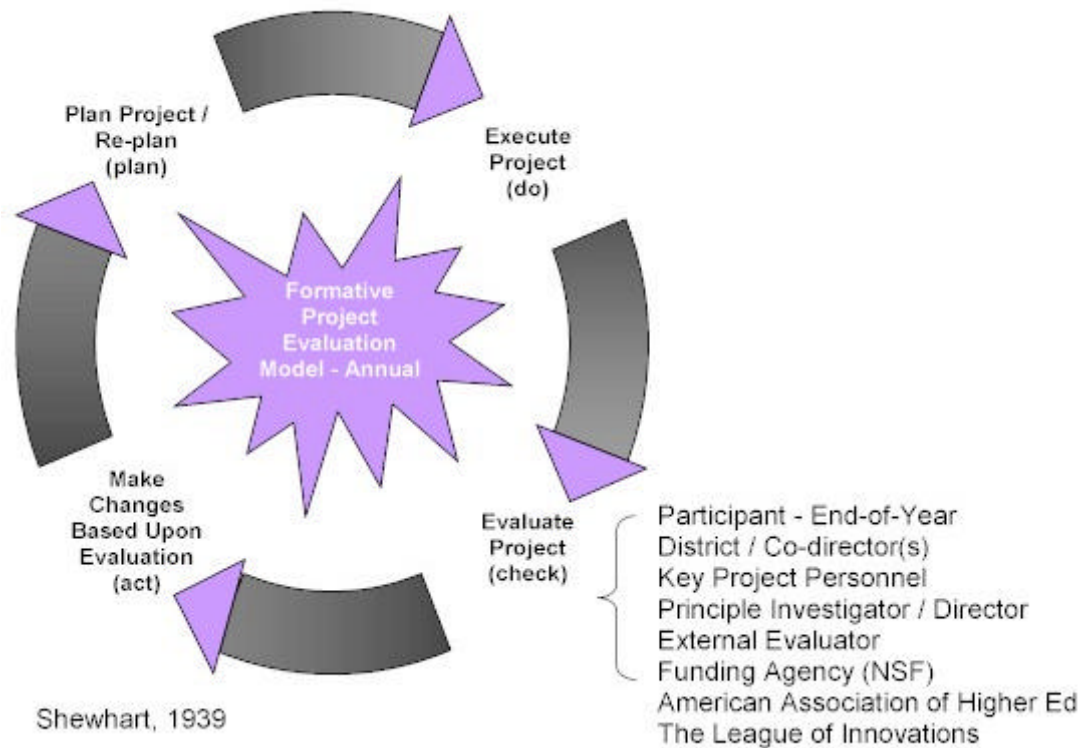
### *Formative Evaluation (Figures 8 and 9)*

During each year of the project, whether the prior pilot years were funded by the ISBE or the IBHE, the same Deming PDCA Cycle was adopted. The project was planned, evaluated, and changed if necessary. The cycle then began again. The component included the following types of evaluation:

- 1) Participant end-of-year evaluation; culminating reports from feedback were also used for evaluation purposes, in addition to the end-of-year evaluation questionnaires/interviews
- 2) External evaluator end-of-year evaluation of all products, processes, and pilot results
- 3) PI/director end-of-year evaluation
- 4) Co-director(s) of RPS and RVC end-of-year evaluation
- 5) NSF evaluation at the end of the second NSF-funded year
- 6) Core project team end-of-year evaluation in the form of debriefing and recommendations for changes
- 7) BIC evaluation (not possible for every year)
- 8) Product evaluations
- 9) Pilots – student achievement results

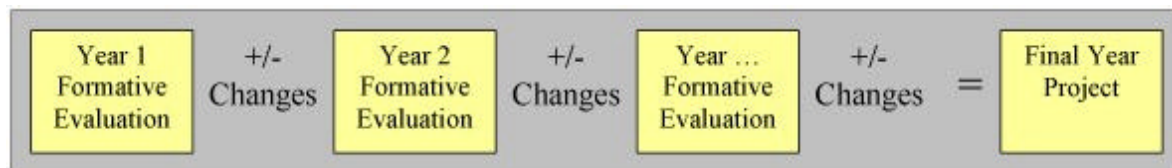
The EE reviewed all products, data, and results, also using his own interview and observation data, and wrote a separate evaluation letter. The PI/Director summarized all data, product reviews, pilot results, feedback data, and other information, and wrote an end-of-year report; the EE reviewed and approved the report. The PI/Director and EE submitted a joint report summarizing what was accomplished, including supporting evidence. All goals and objectives were usually exceeded.

## Formative Project Evaluation Model - Annual



**Figure 6.8 Formative Project Evaluation Model – Annual**

Participants + Project Administration + Project Products + Research Results + External Evaluator = Formative Evaluation  $y_1$  ... Final Year



**Figure 6.9 Formative Evaluation Flowchart**



**Figure 6.10 Summative Results**

### *Summative Evaluation (Figure 10)*

At the end of the project, the PI submitted all data, products, and results to the EE for review. The EE performed exit interviews with participants, wrote a separate letter of evaluation, and reviewed the report. The PI/Director wrote an end-of-grant report summarizing all data, results, product reviews, and external reviews (e.g., NSF visitation report). The EE approved the report. The PI/Director and EE submitted a joint report, which is accessible at [www.strategicalliance.niu.edu](http://www.strategicalliance.niu.edu).

### *Bibliography*

- Beavers, D. (2001). Professional development: outside the workshop box. *Principal Leadership*, 1(9), 43-46.
- Bernauer, J. (2002). Five keys to unlock continuous school improvement. *Kappa Delta Pi Record*, 38(2), 89-98.
- Birman, B. F., Desimone, L. M., & Porter, A. C. (2000). Improving teachers' in-service professional development in mathematics and science: The role of postsecondary institutions. *Educational Leadership*, 57(8), 28-33.
- Bradshaw, L. K. (2002). Technology for teaching and learning: strategies for staff development and follow-up support. *Journal of Technology and Teacher Education*, 10(1), 131-150.
- Burke, K. (2000). Results-based professional development. *National Association of Secondary School Principals*, 84(618), 29-37.
- Burke, K. (1997). Responding to participants' learning styles during staff development. *The Clearing House*, 70, 229-301.
- Collay, M., Dunlap, D., Enloe, W., & Gagnon, G.W., Jr. (1998). *Learning circles: Creating conditions for professional development*. Upper Saddle River, NJ: Corwin Press, Inc.
- Collinson, V. (2000). Staff development by any other name: changing words or changing practices? *The Educational Forum*, 64(2), 124-132.
- Cozart, S.C., & Gerstl-Pepin, C. I. (2002). Teacher morale gets a boost. *Journal of Staff Development*, 23(2), 29-31.
- Deming, W. E. (Ed). (1986). *Statistical method from the viewpoint of quality control: by Walter A. Shewhart*. New York: Dover.
- Dufour, R. (2000). The superintendent as staff developer. *School Administrator*, 57(8), 20-24.
- Finch, C. (1999). Using professional development to meet teachers' changing needs: What we have learned. *National Center for Research in Vocational Education*, 143, 17.
- Fuchs, D., & Fuchs, L.S. (2001). One blueprint for bridging the gap: Project PROMISE (Practitioners and researchers orchestrating model innovations to strengthen education). *Teachers Education and Special Education*, 24(4), 304-314.
- Gatlin, L. (2002). Staff developers, honor thy teachers. *Journal of Staff Development*, 23(2), 72.
- Glickman, C., Gordon, S., & Ross Gordon, J. (2001). *Supervision and instructional leadership: A developmental approach* (5<sup>th</sup> ed.). Boston: Allyn & Bacon.

- Grace, D.H. (1999). Paradigm lost (and regained): How to revitalize your professional development days. *Independent School*, 59(1), 54-57.
- Hopkins, D., & Harris, A. with Singleton, C., & Watts, R. (2000). *Creating the conditions for teaching and learning: A handbook of staff development activities*. London: David Fulton Publishers.
- Hillkirk, K., et al. (1997). Strengths and challenges of a rural professional development collaborative. *Reports – Descriptive*, 141, 20.
- Hirsh, S. (2000a). Bringing staff development home. *High School Magazine*, 7(9), 48-49.
- Hirsh, S. (2000b). Smart shopping for professional development. *High School Magazine*, 7(7), 50-51.
- Hirsh, S. (1999). Developing teachers' instructional skills. *High School Magazine*. 7(1), 48.
- Hirsh, S. (1999). Standards-based professional development. *High School Magazine*, 7(4), 31.
- Hirsh, S., & Sparks, D. (1999). Staff development resolutions for the next millennium. *High School Magazine*, 7(2), 20-24.
- International Technology Education Association. (2003). *Advancing excellence in technological literacy*. Reston, VA: ITEA.
- Ishikawa, K. (1985). *What is total quality control?* Englewood Cliffs, NJ: Prentice-Hall Inc.
- Jackson, A.W., & Davis, G.A. (2000). *Turning points 2000: Educating adolescents in the 21<sup>st</sup> century*. New York: Teachers College Press.
- Jones, K., & Holder, K. (2001, April). *Teacher opportunities to learn: Case study of a content institute in mathematics*. Paper presented at the Annual Meeting of the American Educational Research Association, Seattle, WA.
- Joyce, B., & Showers, B. (1995). *Student achievement through staff development*. White Plains, NY: Longman.
- Joyce, B., & Showers, B. (1980). Improving in-service training: The messages of research. *Educational Leadership*, 37, 379-385.
- Joyce, B., & Weil, M. (2000). *Models of teaching* (6<sup>th</sup> ed.). Needham, MA: Allyn & Bacon.
- Keifer-Barone, S., & Ware, K. (2002). Organize teams of teachers. *Journal of Staff Development*, 23(3), 31-34.
- Killion, J.P. (2002). Aim high and reach out for support. *Journal of Staff Development*, 23(1), 64-65.
- Lipka, R.P., & Brinthaupt, T.M. (Eds.). (1999). *The role of self in teacher development*. Albany: State University of New York Press.
- Magestro, P.V., & Stanford-Blair, N. (2000). A tool for meaningful staff development. *Educational Leadership*, 57(8), 34-35.
- Markowitz, N., & Whittaker, A. (1999 April). *Beyond the professional development school model: the professional development district*. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Canada.
- McKenna, G. (1998). Mentor training: the key to effective staff development. *Principal*, 77, 47-49.
- Metzler, M. (1990). *Instructional supervision for physical education*. Champaign, IL: Human Kinetics.

- Murphy, M. (2002). Let's change staff development to professional learning. *Principal*, 81(4), 16-17.
- National Association of Secondary School Principals and the Carnegie Foundation. (2004). *Breaking Ranks II: Strategies for leading high school reform*. NAASP.
- National Staff Development Council Standards for Staff Development. (2001). Retrieved from [www.NSDC.org/standards](http://www.NSDC.org/standards).
- O'Very, D.I. (1999). Self-paced: The right pace for staff development. *Journal of Continuing Education in Nursing*, 30(4), 182-187.
- Peterson, K.D. (2002). Positive or negative. *Journal of Staff Development*, 23(3), 10-15.
- Redding, J., & Kamm, R (1999). Just-in-time staff development: One step to the learning organization. *NASSP Bulletin*, 83(604), 28-31.
- Reed, P. (2000). Introduction to the special section. Professional development II: Faculty and staff. *Bulletin*, 84(618), 3-5.
- Rhoton, J., & Bowers, P. (Eds.). (2001). *Professional development leadership and the diverse learner. Issues in science education*. Arlington, VA: NSTA Press.
- Riggs, I.M., & Sandlin, R.A. (2000). Teaching portfolios for support of teachers' professional growth. *National Association of Secondary School Principals*, 84(618), 22-27.
- Sanborn, J. (2002). Targeted training. *School Administrator*, 59(11), 16-19.
- Senese, J.C. (2002). Energize with action research. *Journal of Staff Development*, 23(3), 39-41.
- Shewhart, W.A. (1939). *Statistical method from the viewpoint of quality control*. Washington, DC: Graduate School of the Department of Agriculture.
- Sparks, D. (1997). A new vision for staff development. *Principal*, 77, 20-22.
- Terehoff, I.I. (2002). Elements of adult learning in teacher professional development. *NASSP Bulletin*, 86, 65-77.