11. Integrated Interdisciplinary Curriculum Development*

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Curriculum development is not for every teaching professional. "Who is to design and develop the curricula?" is one of the first and most important questions to explore when working with teaching professionals. Many assume that teachers have the knowledge and skills to design and develop curricula. We have found that some do, but they must prepare to do it successfully. The curriculum must have a solid academic base and purpose and include answers to basic questions about the teaching and learning process. The development of appropriate curricula requires a design, clear goals or standards, and student assessments with high integrity. We incorporated Bloom's Taxonomy as a metric to assist in designing curricula (Bloom, 1949; Bloom et al., 1956) and Anderson and Krathwohl's (2001) revised Bloom's Taxonomy to incorporate new knowledge and thought into the framework.

Current Literature

Many resources are available to assist in the development of the integrated or interdisciplinary curriculum. Those discussed below reinforce what we have done and inform our continuing process and work.

The nature of curriculum design has changed. Wiggins and McTighe (1998) explain the new approach as "backward design." As they note, "To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now so that the steps you take are always in the right direction" (based on Covey, 1990). This involves focusing on the standards, for they specify what students are to know and be able to do. They become the teaching and learning priorities upon which the curriculum and assessments are based. Standards combined with student interests, needs, levels of development, and prior achievements are considerations in designing a curriculum. The curriculum is the means to the end. Wiggins and McTighe call the process backwards because rather than beginning with lessons, activities, or textbooks, it begins with goals or standards, "the end," to determine what evidence of learning is desired and then derives the rest of the curriculum content. More than 50 years ago, Tyler (1949) described something very similar to this process. And as noted earlier in this book, good vocational or technical educators have long used this process.

Backwards design requires one to "identify the desired results, determine the acceptable evidence of learning, and then plan the learning experiences and instruction" (p. 9). Decisions are critical regarding the evidence of learning. If tests are only indicators of performance potential, then performances are evidence of what one can do. It is important to determine what is acceptable as evidence of learning, indicators of performance potential, or direct evidence of

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* Jerry Allen often served as primary leader of this program component.

authentic performance. Tests are not genuine but rather are a means to an end (Chatterji, 2003; Wiggins, 1998). Some student learning assessment questions to consider are: What is worth being familiar with? What is important to know and do? And finally, what is so important that one would want to provide evidence of "enduring" understanding?

Pinar et al. (1995) trace the development of curriculum with an historical focus on "understanding" it. For example, in Chapter 3, "Understanding Curriculum as Historical Text: Crisis, Transformation, Crisis, 1928-1969," they discuss John Goodlad's (1966) *School, Curriculum and the Individual*, which focused on "the interwoven nature" of curriculum. In Chapter 13, "Understanding Curriculum as Institutionalized Text," they discuss Murphy's (1991) six organizational threads: "(1) flexible use of space, (2) less regimented scheduling patterns, (3) nontraditional grouping patterns within classes, (4) more flexible instructional arrangements, (5) less emphasis on self-contained classrooms, and (6) less use of age grouping patterns" (p. 679). Furthermore, in addressing curriculum sequence, they refer to Armstrong's (1989) most common strategies: chronological, thematic, part-to-whole, whole-to-part, and integration, referring to Goodlad and Su (1992) and Aceland (1967) "to interweave curricular elements such as concepts, skills, and values so that they are mutually reinforcing." The most important point made is that curricular integration really occurs within the individual student (p. 697).

Fogarty and Stoehr (1995) and Fogarty (2002) also provide integrated models, specifically making this point. Design of the curriculum and the teaching and learning process provides the opportunity for students to internalize what they are learning in a way that leads them to see the interrelationships and interdependencies across the disciplines. There are many other relevant and important references mentioned throughout Pinar et al. (1995), as the authors provide a rather comprehensive review to deepen understanding about the purpose of curriculum and what leads to successful learning. This work is a must for those who really have a desire to understand curriculum and its evolution for development purposes and want a quick reference to all the great thinkers on the topic of curriculum.

Drake (1993, 1998) and later Drake and Burns (2004) are good sources for the process to use with teachers to develop their knowledge and skills in curriculum development, especially integrated or interdisciplinary curricula. Their method helps to simplify and streamline the process without losing integrity and rigor. They also present assessment as an integral component. The authors address why integrated curricula work and discuss the academic gains, student benefits, and effects if teachers are to be leaders of learning. This puts the burden of learning where it should be – on students. For example, when an integrated curriculum is weak or superficial, it is impossible to engage students in a deeper learning experience.

We have worked to ensure that a deeper level of knowledge or skill was the focus of learning for each discipline included in an integrated unit. Each discipline had to go beyond the superficial and lead students to a more substantial level of learning. This was not always easily accomplished when working with teacher teams or curriculum development. The members of an interdisciplinary team were likely to be diverse in background and outlook and to vary in knowledge, skills, and ability. Program leaders need to ensure that the content of each discipline has depth, rigor, and integrity.

Drake (1998) discusses preliminary evidence beginning to accumulate related to integrated curriculum. She looks at Vars's reviews of more than a hundred studies done between

1956 and 1995. Vars concludes that "students in integrated programs do as well as, and often better than, students in conventional programs. …[Also,] almost without exception, students in any type of connected curriculum program do as well or better on basic skills than students in traditional programs.…[T]he results of standardized tests follow the same pattern" (p. 33). There is not yet sufficient evidence to determine if integrated curriculum produces superior results. The NSF PHYS-MA-TECH project confirmed Vars's conclusions in a yearlong course that integrated physics, mathematics, and technology education at the high school level (Scarborough, 1993a). However, there needs to be a more tightly controlled study on integrated curricula, one that also studies each teaching/learning treatment individually as well as together. Our approach involves more than the integrated curricula content. Each treatment variable needs to be studied independently, and the combined interaction effects of multiple treatments also need to be studied. Drake (1993) and Scarborough (1993b) also reinforce the nonacademic benefits of using an integrated approach: the quality of school life seems to improve; teachers, students, and even parents report that learning is more enjoyable, relevant, stimulating, and motivating.

This type of learning does require teachers to engage in deep change. They must think and teach differently and must unlearn the models, processes, and strategies that are not as effective, or at least let them go. However, once the changes begin and teachers see the advantages of transferring the burden of learning to the students, they become "leaders" of learning. Teachers in the Rockford program began to request additional program components and also deeper levels for initial program components. We used Fogarty's Models of Integration, but Drake presents a more substantial model, which we used as our basis for leading teachers to deeper "understanding" about curricular integration, especially when considering the integration of the metacognitive skills as well as more discipline-specific knowledge and skills.

Erickson (2003) distinguishes among multidisciplinary, interdisciplinary, and transdisciplinary. However, curriculum development leaders often use these terms differently. Jacobs (1989) presents a continuum of options, ranging from discipline-based to parallel disciplines, multidisciplinary, interdisciplinary, integrated day, and complete program. We made her models integral to our process and models before it became common to focus more substantially on the integrated or interdisciplinary curriculum. For example, we used a layering approach, trying to lead the teacher to think of interdisciplinary and integrated curriculum as having levels. (This is not the same as the Nunley (2002) approach to layered curriculum.) We wanted teachers to understand that "inter" meant "between" and that "meta" meant "beyond." We wanted teachers to achieve an integrated curriculum that was inter-disciplinary, inter-cognitive, and inter-curricular, where

- the inter-disciplinary aspect focused on the "knowing" of the discipline-specific theories, concepts, techniques, principles, and processes
- the inter-cognitive emphasized cognitive processes such as analysis, reasoning, etc.
- inter-curricular meant something much broader, where teachers emphasized anything, like writing or technology, that they wanted to thread throughout the curriculum

This could even include developing and organizing learning through student teams or the development of classroom social skills necessary before learning can begin.

Our approach was successful. Teachers began to understand the importance of integrating or threading (Fogarty, 2002) other knowledge or skills across disciplines to reinforce learning across contexts and courses. Threading provided an opportunity to reinforce learning considered important across disciplines and teachers. We integrated from many different perspectives. Even when not integrating across related disciplines, such as mathematics, science, and technology, we saw the potential to integrate on other curricular topics critical across disciplines, especially cognitive skills and processes, use of technology for learning, behavior skills, and more. Integration can extend beyond discipline-specific standards or content (knowledge or skills) and can build stronger general knowledge, processes, or skills.

When working with teachers or choosing models for integrated or interdisciplinary curriculum from particular authors or analysts, it is important to consider their definitions and either make them your own, modify them to fit, or use your own with very definite meaning. Leaders must then clearly present the definitions to teachers. This will confuse them at first, but soon they will understand that terminology means different things to different people, and that once they agree on the meanings, they can operate from a unified basis. I suggest favoring terms and definitions represented by the best and most commonly cited research.

Erickson (2003) discusses the major trends and issues, noting why it is important to integrate the curriculum: to promote deeper understanding of more complex issues, problems, and topics; to bring about an understanding that knowledge is interrelated; to illuminate relevance to students' lives; to build interest in learning; to motivate learning; and finally to better manage curriculum by contextualizing it. She believes it is more efficient and meaningful when curriculum is contextualized around themes, making it possible to achieve interdisciplinary standards in a single unit. We agree with all this. She also presents models and processes for building integrated units of high integrity.

Mallery (2000) reviews 10 years of educational reform in an enlightening historical perspective that gives context for integrated curriculum. She reviews the history of interdisciplinary curriculum and the arguments about its benefits. The definition she favors is from Brazee and Capelluti (1995):

> Integrated curriculum is based on a holistic view of learning and recognizes the necessity for learners to see the big picture rather than to require learning to be divided into small pieces. Integrative curriculum ignores traditional subject lines while exploring questions that are most relevant to students. As a result, it is both responsive to students' needs and intellectual because it focuses on helping learners use their minds as well. There is, in fact, no one integrative curriculum, but rather principles of teaching and learning that guide the development of integrative curriculum in diverse setting. (p. 8)

This is very important to our work, since we believe that curriculum products should encompass the teaching and learning process, assessment content, process, and procedures.

Meinbach et al. (1995) provide a guide for the development of thematic units. They address teaching from a thematic perspective: how to plan units and their instruction, select and

organize materials and resources, design activities and projects, and implement the unit. They describe the nature of more authentic assessment, including the use of portfolio assessment, types of portfolios, portfolio development and management, engaging students in self-assessment through their portfolios, criterion checks, and more.

Campbell and Harris (2001) also provide a substantial resource for teachers collaborating on the development of integrated curriculum. The authors focus on the importance of teacher team development. And, although Campbell and Harris's review of team-building content and process is brief, they do address the topic. The team-building aspect of our program was very important because the professional development on teaming was where teachers determined their focus: their vision for themselves and their students, their team process, their mission, and the direct goals and objectives for accomplishing their vision.

In summary, resources available today can assist those interested in the development of the integrated or interdisciplinary curriculum. These are a few that seem to reinforce what we have done and further inform our continuing process and work with teachers to integrate curricula.

Integrated Curriculum in Our Program

The integrated MSTE curriculum modules developed by teachers in our programs were culminating projects in themselves. They were developed gradually, with each component contributing a strategic focus and fit to the ultimate goals. When teachers began to see the elements come together, they became very excited about the possibilities with students in their classrooms and realized they were going to be able to use what they learned in a very real sense. For example, the learning styles, teaching models, assessments, and other workshops became even more real as they fit into the whole framework of the integrated module. The module was designed to bring it all together; the teachers developed aspects of the curriculum through the professional development program and then were provided with dedicated time at the end of the program to complete and finalize the modules. The framework is fully described below.

In "Practicing What We Preach in Designing Authentic Assessments," Wiggins (1996-1997) identifies the assessment of *faculty products* and how that might take place. He questions how we ensure that ongoing design and reform work is more rigorous and credible. He discusses how the Center on Learning, Assessment, and School Structure (CLASS) in Princeton, New Jersey, "use[s] design standards and a workable peer review process for critiquing and improving all proposed new curricular frameworks, tests, and performance assessments" (p.18). Since 1990, we have been doing a very similar version of what he describes. However, Wiggins and CLASS confirm that our process is credible and very important.

When teachers began their adventure with us, they focused on designing their culminating project and products: the interdisciplinary, integrated mathematics, science, technology, and English curricula modules, one per team or teacher. This product incorporated much more than content, for it consisted also of standards, context, assessments, new strategies, and new teaching models and activities. We provided a template, explanation, check-off form, rubric, and reference books (Tables 1 – 10). Teachers engaged in a guided development process that included immediate, direct, and one-to-one or team feedback and a review process with self-assessment and assessment by the program leaders and others. The session ended formally with

a review of accomplishments (evaluative in nature) with the teams, teachers, program leaders, and school administrators. In addition, we reviewed with local administrators to celebrate their accomplishments.

The module required the following components:

- *Check-off Form (Table 1).* A list of all minor and major requirements.

- *Introduction (Tables 2, 3, 8, 9).* Title, Timeline, Description, Purpose and Rationale, Learning Standards, Interdisciplinary Content Areas, MSTE, Industrial Partners and Partnership Activities, Specialized Vendors and Equipment (sources and contact information), Teaching Models and Models of Integration, Technology Utilization (WebQuests, Websites, PowerPoint Presentations, Spreadsheets, Imaging, Videos), discipline-specific technology requirements (CAD, heart monitors, etc.), Bloom's Taxonomy by lesson, Opportunities for Further Fields of Study or for Further Curricular Integration, Performance Task Descriptions; Pretest - Posttest and procedures, as well as Lesson Titles, Number, Benchmarks Addressed, and Ranking.

- *Lesson Activities and Procedures (Tables 4, 7, 10).* Lesson Titles and Numbers; Lesson Topics; Lesson Benchmarks (by standard); Length; Materials, Equipment, and Supplies Needed; Student Assessments; Lesson Activities and Procedures (including all handouts, worksheets, visuals, post-lab questions, problem analysis forms, etc.); and Technology Descriptions.

- *Student Activities (Tables 5, 6).* Lesson Titles and Numbers, Lesson Topic Descriptions ("What is the lesson about?" and "What are we going to do today?"), Student Artifacts, and Assessment Procedures.

- *Module Rubric (Tables 11-19).* During orientation, teachers received a graphic organizer on the module framework, along with a description of what each section was to include. They received a rubric (Tables 9-12) describing standards and levels of descriptors that the project team used to score the modules. Teachers knew what was expected before attending workshops and agreed to the expectations or requirements and the timeline, or we adjusted them based upon their comments or those of their district's administration. The format and process evolved over several projects. When beginning with a district, we asked them to determine if it would work or need adjustments, or if they had one of their own they preferred. This format invariably exceeded what was available in the district for curriculum development. We did, however, make one adjustment in the last year of the Rockford initiative. Teachers at the most advanced level, who had already produced full modules, could choose either to develop a "collection" of new lessons to infuse into their overall curriculum or develop a new module. We provided feedback and assessment by section. As they finished each section, we gave it a final review and checked it off with them. This progressive method, with check-off procedure, kept

teachers focused and feeling accomplished. A module check-off list was used in conjunction with the template, explanations, and rubric.

- *Evaluation Check-off Form.* (1) Module Conference, (2) Schedule for Implementation, (3) Copy of Module for District Office, (4) Industry Partners, (5) Electronic Copy of Module, (6) Workshop Questionnaire, and (7) Completion Certificate.

- *Final Conference Check-off.* In the final evaluation procedure, (a) modules were turned in, (b) modules were reviewed by professors and master-teacher peer teams, (c) and teachers or teams participated in a conference with the principal and other district personnel, the full team, and the project PI and the external evaluator to review evaluation, commit to piloting or implementation, and receive congratulations.

Teachers engaged in a workshop to prepare for these components and continued with related workshops to support their growth within and across disciplines. The format was initiated by the project PI, reviewed and modified by a project team each year, and then reviewed and adapted by each teacher group. It worked well for very different or diverse teams and districts: Chicago, suburban schools, rural and small schools, mixed northern Illinois regional groups, and Rockford.

The modules ranged from three to eight weeks in duration and were rather complex but very complete in standards, content, models, strategies, processes, procedures, partnerships, activities, and other requirements, including worksheets, project information, visuals, tests or performance assessment information and procedures. They were easily replicable across groups when shared. Individual teachers, when working alone, produced a complete module like the others and accomplished the interdisciplinary MSTE integration as well, but they usually used partners or visiting professors or teachers to help deliver when no team was available.

Process

In later years, the PI, other professors, and a master teacher peer leader led this program component. Based on his experience as a participant in the prior PHYS-MA-TECH project, the master teacher peer became a leader and expert, guiding teachers through an exploration of learning standards, benchmarks, and learning objectives. This exemplified Sims and Manz's (1989) superleadership theory. The teacher-to-teacher relationship was powerful and positive in leading peers through curricular change. Discipline-specific teams thoroughly examined their standards and benchmarks and analyzed coverage and gaps. They reviewed the integrated curriculum, models, the development process, and how to achieve consensus for building an interdisciplinary module. They also examined other aspects, such as pre- and graphic organizers.

After selecting standards and benchmarks upon which to base their modules, teachers met with the partnership coordinator, who organized and managed their experiences with real-world partners in the communities of practice. Teachers began to write their module introductions. We sometimes involved professors in the conceptualization of modules if the team wanted more varied exposure. Teachers divided and visited sites, each bringing back information to the team. On day one, the professors came in to work with them on ideas for their modules, as well as for a

better understanding of the standards, concepts, and principles they were trying to teach and for other creative aspects. The teams had everyone there as a resource while writing the drafts of the module introduction. They emailed the master teacher peer for feedback and then made changes based upon his feedback. They made changes based upon his feedback before coming to the third day of development. On day two, the teams began to develop the lessons, activities, and procedures sections. For days three, four, and five, they continued in the same pattern.

One or more professors and the PI usually supported these days of activity, depending upon the need. Teachers submitted the modules for review by the master teacher peer, one or more professors, sometimes industrial partners, and the PI and external evaluator. Teams and teachers then participated in the final review with the master teacher peer, professors, district personnel, PI, and external evaluator. We tried to have the principal visit during the workshops and participate in the review. When principals could not attend, we asked other district administrative personnel to visit.

We tried several strategies for having teachers work with higher educators in MSTE. In some years, we had professors available on site to help the teams with discipline-specific content work; during other years, we had professors on call rather than just sitting and waiting. These models work to some degree, but there is a lot of down time for the professors and a lot of development time where the teachers do not seem to really need any help. We have also had professors read and evaluate the modules, after working with the teachers, when the modules were completed. These methods all worked rather well. In between, we had teachers participate in discipline-specific workshops called updates, learn more deeply about MSTE, and then have an expert in curriculum and a master peer teacher evaluate the modules. This system also worked well. Teachers felt rewarded when a master peer *and* a professor they trusted and respected evaluated the modules. In fact, they really preferred and more highly valued a professor's evaluation of their work rather than a district evaluation.

Teachers highly respected the role of the external evaluator, our third party, who contributed insight and feedback. Depending upon the year, industrial partners were asked to validate or review the curriculum or participate as review team members.

Another aspect of the curriculum development was the participation of industrial or community partners. Teachers spent three to five days visiting five industries or more each summer or during the year. They entered into these learning experiences with the assignment of learning more about standards in real-world contexts, while also seeking more authentic performance tasks or assessment procedures, deepening their understanding of MSTE in more authentic contexts, and learning more about careers. Teachers highly valued these experiences, and our program would have lacked a critical component without them. However, a change in the model occurred over the last few years. For a while, we paid stipends for the days spent visiting BIC partner sites, as long as they were not school days. Later, as we began the transition to sustainability in Rockford, we made these days required "homework," where only continuing professional development units (CPDUs) were provided. The Rockford district has since implemented a new policy that there are to be no stipends for professional development, but the teachers will receive recertification CPDUs or professional development credits. This reinforces the professional responsibility of staying current on new research and ideas.

Designing effective curricula requires addressing key questions about focus, standards, assessment, and evidence of learning. What are students to learn and be able to do? Learning must have a specific purpose, and so must the curriculum. How do teachers want students to provide evidence of what they have learned, and to what level do they want students to show what they have learned? Evidence can range from simple memorization (Bloom's knowledge level) to manipulation of knowledge, concepts, or principles.

The "how deeply" would better address capabilities to synthesize, analyze, and evaluate – or to "create" on Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001). In our initiatives, the teachers based their modules on standards chosen from each MSTE discipline, after analyzing those that naturally crossed over disciplines and those that might be specific to each discipline. Both could easily be incorporated, using several integrated curriculum models simultaneously. Cognitive or academic skills could be threaded across disciplines. And for the assessment component, we suggested a range of assessments, including both traditional and authentic and performance-based assessments, as well as portfolios. Inclusion of the English discipline provided opportunities to build good assessments using communication as the process for providing evidence of learning.

Once the teachers addressed the key questions, they moved on to the decisions related to contextualizing the learning. What type of learning experience will best suit the standards and assessment? What other content can be used to excite students about learning? What teaching models will best suit the focus of learning? We guided the teachers through the development process and provided support for instructional decision making.

At this point in our initiatives, the process was led by the master peer teacher leader, not the PI. We had a gifted individual for this role, an expert in curriculum development who was knowledgeable about mathematics, physics, and technology and very capable in chemistry, biology, and English. As a secondary technology education teacher with good foundations in MSTE, he had been a key leader and was greatly respected by the participating teachers. Various external factors, including teacher preference, the awarding of university credit and state CPDUs, and district perception about evaluation, encouraged us to maintain the involvement of the professors, PI, and external evaluator in the evaluation process.

Integrated Curriculum

Fogarty and Stoehr's (1995) *Integrating Curricula with Multiple Intelligences* addresses integrated curriculum models, multiple intelligences, teams, themes as organizing centers and catalysts, and threads from several perspectives, while weaving in the theory information. It is regularly updated. Our teachers also read *Awakening Genius: In the Classroom* by Armstrong (1998).

Fogarty and Stoehr posit 10 models of integration:

1. Fragmented (least integrated, representing disconnected content typical of isolated teachers and single-discipline curriculum)
2. Connected (subtle connections are made between disciplines)
3. Nested (skills are nested within a subject matter)
4. Sequenced (curriculum is rearranged to coincide with others)

5. Shared (concepts naturally overlap)
6. Webbed (theme-based, with disciplines organized around a related theme)
7. Threaded ("metacurricular approach": social skills, technology skills, metacognitive skill development, writing, etc. can be threaded across disciplines)
8. Integrated (matching natural overlaps across related disciplines through team teaching)
9. Immersed (students immerse themselves and filter the discipline through their own lens to create relevant learning)
10. Networked (making internal disciplinary connections through experts)

We used these for years and tried a range of different requirements in the modules. The most successful were shared, webbed, threaded, and integrated, with some teachers using immersed and networked. We later required integrated, webbed, and threaded in each module. Other models were optional. Teams were also required to show their integration through appropriate graphic organizers.

Some other respectable sources of very good information about integrated or interdisciplinary curriculum are: *Interdisciplinary Curriculum: Design and Implementation* by Jacobs (1989); *Planning Integrated Curriculum: The Call to Adventure* by Drake (1993); and *Curriculum and Aims* by Walkers and Soltis (1992).

Over the years this workshop was taught in a variety of ways. Teachers previous to the initial year with Rockford spent time looking at interdisciplinary models more deeply, as we led them to understand that, when building curriculum, they needed to consider cognitive and curricular factors. Other than the state learning and teaching standards and Bloom's Taxonomy, we gave teachers the following tools: the state's Bloom's analysis for all disciplines; the state's performance indicators to go with the learning standards in each discipline; Dale's Cone of Learning (Wood, 1989); the national *Standards for Technological Literacy: Content for the Study of Technology* (ITEA); *The National Technology Standards* (ISTE); the *Quick Flip Questions for Critical Thinking* (Bloom's-based) by EDUPRESS, a flipchart of questions to ask at different levels of Bloom's Taxonomy; and *Models of Teaching* by Joyce, Weil, and Calhoun (1995; 2000). There are many other sources, some are out of print but excellent nevertheless and available in district offices or libraries. We provided access to reference copies of some, for example, *The TimeTables of Science* (1988), *The TimeTables of History* (1991), *The TimeTables of Technology* (1993), and *The Timelines of the Arts and Literature* (1994).

Teachers should be involved in the curriculum development process. A natural side benefit is that teachers own the curriculum, become expert through the development process, and deepen their understanding of disciplinary content. Interdisciplinary team members broaden and deepen one another's knowledge bases and skills in many areas, especially technology. The best curriculum was developed when we teamed teachers, counselors, professors, and field experts from real-world communities of practice. This resulted in the inclusion of all relevant context, knowledge, skills, and career-building concepts, as well as long-term partners who co-owned it with the teachers and became willing to be involved in teaching and student learning. The involvement of business, industry, community or field experts from communities of practice occurred to varying degrees and in different ways. They helped us identify critical knowledge

and skills, helped teams develop the modules, and continued to partner in the classroom learning experiences. When successful, an informal learning community evolved between teachers, professors, and especially the BIC partners.

Professor Modules

We invited professors to develop modules and then deliver them to students of the teachers with whom they were working. The professors met the teachers and then observed the classrooms. They worked on their own with the format, standards, and other aspects to develop modules and then to deliver them to students in classrooms, with teachers observing or participating. This experience engaged the professors with the secondary students, provided the opportunity for more time with the teachers with whom they would be working, and gave them a feel for the workload, expectations, standards, and needs of those teachers.

Professors developed and delivered the following module samples:

- "Oxygen, A Molecule on a One-Way Trip. We breathe it, we take it for granted, but what really happens to it once it's breathed into the body? Learn about its journey and explore the tiny magnets in our cells (some are carriers, some are consumers) that can attract and bind oxygen molecules. Finally, learn about the 'demagnetizing' effects of two common poisons." A three-lesson module.
- "Solving Mathematical Problems Using Computer-Aided Design. Create specified two-dimensional geometry using CAD, use both mathematical formulae and CAD techniques to determine areas of 2-D shapes and solve typical trigonometry-based problems." A five-lesson module.
- "History, Design and Use of Trebuchets. Investigate history, development, and use of projectile throwers, then build a working model to test the design."
- "Chemistry and the Environment. The relationship between chemistry and the environment…how chemicals cause pollution and how modifications can reduce or eliminate these problems." A four-lesson module.
- "Cell Structure and Function. The processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems."
- "Exploring the Geography of the Local Community. The use of geographic information systems for making scientific discoveries in Rockford, IL." A four-week module.
- "Genres of Technical Communication. The why and function of technical communication." A two-lesson module.
- "Writing Center Links Between NIU and a High School. NIU graduate students work with high school students on writing."
- "Using Accurate Description to Write a Crime Scene Report. As part of a proposed unit built around the concept of 'mystery,' students will work as pairs of detectives describing a crime scene in a written detective's report, revise, edit and finalize their reports."
- "Expanding Horizons Creating Web Pages. Students will learn and practice effective information-gathering skills, learn to evaluate webbed sources, learn to make a

rudimentary but functional web page, and learn to make brief annotations explaining the relevance of the sources they find."

This is a great way to give professors hands-on experience in K-12 classrooms. Actually engaging with the students develops a deeper understanding of the teaching and learning requirements, issues, and constraints and brings about a greater understanding that there must be a wide repertoire of instructional strategies, models, processes, curricula, and procedures from which to draw. A side payment is that professors return to their own teaching and classrooms with important questions and considerations about their own curriculum and teaching process.

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Table 11.1 Module Template

Introduction	
Team Name:	**School**:
Team Members:	
Module Title: Be sure that the title accurately describes the activities included in the module.	**Timeline**: How many weeks will the module take and when do you anticipate beginning the modules activities?
Brief Description of Module: Give a one or two sentence description overview of the scope and content of the module.	
Purpose and Rationale of Module: What are the specific educational goals of this activity? Why are we teaching this lesson? What makes it important enough in its role outside of education to include it in the curriculum?	
Related State Learning Standards: List all State standards that will be addressed in this module. Use the following form when listing them. (5 B, Analyze and evaluate information acquired from various sources)	Related District Standards:
Interdisciplinary Content Areas Involved in Module: List all content areas involved in this module and the topics to be covered by the content area.	
Industrial Partnership Activities: Describe any activities in which industrial partners are involved. Be sure to indicate who the partner is as well as the type of help they are giving your module.	
Specialized References, Vendors, or Equipment: List all sources or references that are specific to this activity and may be difficult to locate. Do not waste time listing all common sources like the hardware store or dime store. If you don't have specialized references of vendors, then just type "none."	

Table 11.2 Module Template (continued)

Teaching Models: (indicate # of times each model is used in the module)					
	Memory/Mnemonics		Graphic Organizers		Inquiry
	Progressive Part Method		Concept Attainment		Simulations
	Advance Organizer		Concept Formation		Jurisprudential
	Lecture		Concept Presentation		Direct Instruction
	Reciprocal Teaching		Conceptualization		Training Model
	Mastery Learning		Inductive Thinking		Synectics
	Cooperative Learning		Deductive		Others (identify)
	Psychomotor		Metaphorical		
Model of Curricular Integration		Technology Utilization (Check all that apply)		*Pre-Identified Web Sites*	
	Fragmented		Word Processing		
	Connected		Spreadsheets		
	Nested		Presentation Software (e.g. PowerPoint)		
	Sequenced		E-Communications		
	Shared		Imaging (cameras, scanners etc.)	Level's of Bloom's Taxonomy (# of times each is used)	
	Webbed		Web Searches		Knowledge
	Threaded		Multimedia		Comprehension
	Integrated		Desktop Publishing		Application
	Immersed		Video		Analysis
	Networked		CAD		Synthesis
			WebQuest		Evaluation
			Other (explain)		
Are you working with student teams in this module? Please check one				Yes	No

Opportunities for further curricular integration: In this section, we would like you to give some ideas for integration and exploration that were not developed but could be. For example, are there other content areas that could be included to enhance the module? Dream a little here!

Performance task description: Each module must include at least two complex, integrated, performance tasks or one complex, integrated performance task, and an individual performance task from each discipline (as described by the performance task rubric). Give a brief description of the performance task. Be sure to include a description of how you will assess both the product that you are asking the students to create, as well as the process that they will use to deliver it. Attach performance tasks and assessments immediately behind this page.

How will you assess a) Process and b) Product

Please place performance tasks and assessments behind this page

Performance task description: **How will you assess a) Process and b) Product**

Please place performance tasks and assessments behind this page

Pre-Post Test Procedures:

Table 11.3 Module Template (continued)

Lesson Order and Titles		
Lesson Number	**Lesson Title**	**Benchmarks Addressed**

Table 11.4 Module Template (continued)

Lesson Activities and Procedures
Lesson Number and Title:
Lesson Topic: In a well-formed sentence describe the topic of the lesson.
Lesson Benchmarks: Type out the actual State Benchmarks or District objectives that the lesson will address. If the lesson does not address a specific benchmark/objective, write "N/A" in the space provided.
Length of lesson: (number and length of class periods)**:**
Materials, Equipment, and Supplies needed: List all materials, etc. needed to complete the lesson
Student Assessment Describe process and instruments to be used. Attach tests and other traditional assessment. Authentic assessment activities and their rubrics should be attached to student activity manual
Daily Lesson Activities and Procedures (include tasks, references, and attach materials to be used): List each activity with its necessary procedures. Clearly describe the use of technology by both teacher and the students. This is a "cookbook" approach. It will allow other teachers to easily follow this activity. It should include both the content and how it should be taught. Note: In this section, include all handouts, worksheets, visuals, post-lab questions, problem sheets, etc. that are to be used with this activity. These should be integrated into the packet. However, each form should be on its own sheet. This is so they may be photocopied for use in class. For each activity indicate which teaching model(s) you will use and which level of Bloom's Taxonomy the students will achieve.

Table11.5 Module Template (continued)

Student Activities					
Lesson Number and Title:					
Lesson Topic:					
Lesson Benchmarks:					
What is this lesson about?					
What are you going to do today?					
Student Artifacts (Check all that will be used):					
	Written Report		Notebook/Journals		Models (physical/graphic)
	Posters		Multimedia		Web Pages
	Debates		Classroom Presentation		Other (Explain):
Assessment Procedures **(Attach all authentic assessment activities and their rubrics):**					

Table11.6 Module Template (continued)

Module Checklist

Introduction

Description	**Date Completed**
Purpose & Rationale	_____
Module Objectives	_____
Related Learning Benchmarks	_____
Interdisciplinary Content Areas	_____
Teaching Models Included	_____
Model of Curricular Integration	_____
Technology Utilization	_____
Problem Solving Activities	_____
Pre-requisites/Co-requisites	_____
Specialized References/Venders	_____
Lesson Order and Titles	_____

Teacher Activity Manual

Description	**Date Completed**
Timeline	_____
Materials, Equip. & Supplies	_____
Opportunities for Further Integ.	_____
Industrial Partnership Acts.	_____
Student Activity Manual	_____

Table 11.7 Module Template (continued)

Teacher Activity Manual (continued)

Description	Date Completed
Lesson Number and Title	_____
Lesson Topic	_____
Lesson Objective	_____
Lesson Introduction	_____
Activities to be Completed	_____
Student Artifacts	_____
Assessment Procedures	_____
Performance Tasks	
Performance Task 1	_____
Assessment/Evaluation 1	_____
Performance Task 2	_____
Assessment/Evaluation 2	_____

Lesson Activities and Procedures

Description	Date Completed
Lesson Number and Title	_____
Lesson Topic	_____
Lesson Objective	_____
Length of Lesson	_____
Teaching Model(s) Used	_____
Level(s) of Bloom's Taxonomy	_____
Materials, Equip. & Supplies	_____
Lesson Procedure	_____
Student Assessment	_____

Table 11.8 Module Format Explanation

Module Format Explanation

Use this module format to help you fill in your module template

Module Introduction

Module Title: Be sure that the title accurately describes the activities included in the module

Timeline: How many weeks will the module take and when do you anticipate beginning the module activities?

Module Description: Give a one or two sentence description overview of the scope and content of the module:

Purpose and Rationale: What are the specific educational and technical goals of this activity? Why are we teaching this lesson? What makes it important enough in its role outside of education to include it in the curriculum? What's the real world scenario?

Related Illinois and District Learning Standards: List all State and District standards that will be addressed in this module. Use the following form when listing them. ISTE Technology Standards can be used to describe technology related learning outcomes.

Interdisciplinary Content Areas: List all content areas involved in this module and the topics to be covered by the content area.

Industrial Partnership Activities: Describe any activities in which industrial partners are involved. Be sure to indicate who the partner is as well as the type of help they are giving your module.

Specialized References, Vendors and Equipment: List all sources or references that are specific to this activity and may be difficult to locate. Do not waste time listing common sources like the hardware store or dime store.

Table11.9 Module Format Explanation (continued)

Teaching Models: After you have completed your lesson activities determine how many times each model is used, and then mark the number in the box ahead of the model name.

Model(s) of Integration. Check the model(s) of curricular integration used in developing the module.

Web Sites: List those major web sites used in the teaching of the module. Caution, be very careful to copy the site address accurately including capital or lower case letters.

Bloom's Taxonomy: After you have completed the activities and procedures for all lesson(s), determine how many times each Bloom's level is attained, and then mark the number in the box ahead of the level name.

Opportunities for Further Curricular Integration or Further Fields of Investigation: In this section we would like you to give some ideas for integration and exploration that were not developed but could be. For example, are there other content areas that could be included to enhance the module? Dream a little here!

Performance Task Description: Each module must include at least two complex, integrated, performance tasks or one complex, integrated performance task and an individual performance task from each discipline (as described by the performance task rubric). Give a brief description of the performance task. Be sure to include a description of how you will assess both the product that you are asking the students to create, as well as the process that they will use to deliver it.

Pre-Post Testing Procedures: Describe how students will be assessed to determine how much they learned as a result of delivering the module. Attach assessment instruments to be used.

Lesson Order and Titles: List the lessons in the order that they are placed in the module. List the title and the numerical identifier for the benchmarks taught in each respective lesson. If the lesson does not address a specific benchmark, write "NA" in the space provided.

Table11.10 Module Format Explanation (continued)

Lesson Activities and Procedures

Lesson Number and Title: Lesson number should correspond to the "Lesson Order and Titles" page. Be sure that the title accurately describes the lesson to be taught.
Lesson Topic: In a well-formed sentence describe the topic of the lesson.
Lesson Benchmarks: Type out the actual State and District benchmarks that the lesson will address. If the lesson does not address a specific benchmark, write "NA" in the space provided.
Materials, Equipment and Supplies Needed: List all materials, etc. needed to complete the lesson.
Student Assessment: How can you tell whether your students were successful or not? This is your assessment. A combination of traditional and authentic assessment tools is preferred. Don't forget that students all learn differently. Good assessment and evaluation take this into account. Include all tests and other traditional assessments with answer keys.
Lesson Activities and Procedures: List each activity with its necessary procedures. This is a "cookbook" approach. It will allow other teachers to easily follow and successfully complete this activity. Note: In this section, include all handouts, worksheets, visuals, etc.
Student Activities:
This section should be written in a format that can be duplicated and handed to students, informing them of the purpose of the lesson, what they are to learn, how they are going to be assessed, etc.
Lesson Number and Title: Lesson number should correspond to the "Lesson Order and Titles" page. Be sure that the title accurately describes the lesson to be taught.
Lesson Topic: In a well-formed sentence describe the topic of the lesson.
Lesson Benchmarks: Type out the actual State and District benchmarks that the lesson will address. If the lesson does not address a specific benchmark, write "NA" in the space provided.
What is this lesson about? This section is written to the students. Don't get too technical or wordy. Bring out the interesting and tantalizing aspects of the activity. Really try to get them excited and intrigued.
What are we going to do today? This should be a description of what the students will be doing on a day-to-day basis. For example, if your lesson lasts 5 days, this section should contain information telling the students what kind of activities they will be doing each day. Don't forget to pique their interest!
Student Artifacts: Check each type of work the students will complete.
Assessment Procedures: Describe to the students in detail how they will be assessed and evaluated during the lesson. Include all authentic assessment activities and their associated rubrics.

Table 11.11 Module Rubric

Standard	Descriptor Level I	Descriptor Level II	Descriptor Level III	Descriptor Level IV
Module Introduction				
A Brief Description of Module is provided that outlines the activity being undertaken by students participating in the module	A concise paragraph describing the activity in the module is provided	A description of student activity is given but does not adequately portray the module.	A description is given, but it is confusing or is not clearly understood.	No description of the module is provided.
The Purpose and Rationale clearly describes the reasons for including the Module in the curriculum.	A justification for the content contained in the Module is provided, which is based on sound educational practices and provides a clear link from the Module to applications of learning beyond the school.	A substantial justification for the content is made but is not related to learning required beyond the school.	A justification for the Module content is stated, but it is not sufficient enough to be convincing to justify the inclusion of the Module in the curriculum.	No case is built within the Rationale that would justify the inclusion of the Module in the curriculum
Related State Learning Standards are identified that describe minimum levels at which students are expected to perform after completing the activities in the Module.	At least one standard from the *Illinois Learning Standards* is identified for each of the content areas integrated into the module.	*Illinois Learning Standards* are listed for some content areas, but not all.	*Illinois Learning Standards* listed are not related to the module content.	Standards from the *Illinois Learning Standards* are not identified.
Related District Curricular Learning Standards are identified that describe minimum levels at which students are expected to perform after completing the activities in the Module.	At least one standard from the *District Curricular Standards* are identified for each of the content areas integrated into the module.	*District Curricular Standards* are listed for some content areas, but not all.	*District Curricular Standards* listed are not related to the module content	Standards from the *District Curricular Standards* are not identified.

Table 11.12 Module Rubric (continued)

Standard	Descriptor Level I	Descriptor Level II	Descriptor Level III	Descriptor Level IV
Each Interdisciplinary Content Area Involved in the Module is identified and described.	Each school subject area (course) integrated into the Module is identified and content area described.	Each subject area is identified, but content to be included is not described.	One or more subject areas have been omitted.	Interdisciplinary content areas are not identified nor described.
Ways that Industrial Partnerships are utilized to enhance the instructional activities within the Module are described.	Multiple examples of student activities utilizing the resources provided by industrial partnerships to enhance the Module are provided.	Examples of uses of industrial partnerships are listed but not fully described.	Examples of uses of industrial partnerships are listed that are NOT appropriate to the listed activities or are obvious, i.e. guest speakers or field trips.	No examples of the uses of industrial partnerships are described.
Specialized References and Vendors are listed that are specific to the activities contained in the Module.	A complete list of specialized references and/or vendors is provided for each activity contained in the Module.	A list of references and/or vendors is provided, but it is not clearly related to the activities contained in the Module.	A list of references and/or vendors is provided, but is incomplete.	No specialized reference or vendor list is provided.
Teaching Models employed within the Module have been identified.	All Teaching Models employed within the Module have been identified and frequency of use indicated.	Some Teaching Models used in the Module have been omitted and/or frequency of use not indicated.	Some Teaching Models are identified that are not employed in the Module.	No Teaching Models have been identified.
The Model of Curricular Integration employed within the Module is identified.	The Curricular Integration Model employed in the Module is accurately identified.	The Curricular Integration Model identified is not evident in the Module.	The Curricular Integration Model evident in the Module is not the one identified.	A Curricular Integration Model is not identified.
Technology utilized in the Module activities has been identified.	All Technology utilized within the Module is accurately identified.	All Technology identified is not evident in Module activities.	All Technology described in Module activities has not been identified here.	Technology has not been identified.
Web Sites are identified that relate to Module activities.	Major Web Sites are accurately identified that relate to Module activities.	Identified Web Sites are not evident in Module activities.	Major Web Sites described in Module activities have not been identified here.	No web sites have been identified.

Table 11.13 Module Rubric (continued)

Standard	Descriptor Level I	Descriptor Level II	Descriptor Level III	Descriptor Level IV
The Levels of Bloom's Taxonomy of Objectives are identified.	The frequency of use for each of Bloom's Levels is identified and accurately relate to the Module activities.	Bloom's Levels are accurately identified, but frequency of use is not indicated.	One or more of Bloom's Levels checked do not relate to the Module activities.	No Bloom's Levels are identified.
Opportunities for Further Curricular Integration that allow teachers to explore expanding instructional activities are described.	At least one additional integration model is suggested and described that might be employed by future teachers using this Module.	An additional integration model is suggested, but the description does not support the identified integration model.	An additional integration model is suggested, but no description is outlined.	No ideas for expansion of curricular integration models are presented.
The Module includes at least two properly constructed Performance Tasks.	Each Performance Task scores at least the 75% level as measured by the Performance Task Rubric.	One-half of the Performance Tasks score at least the 75% level; all others score at least the 50% level.	All of the Performance Tasks score at least the 50% level.	All Performance Tasks score below the 50% level as measured by the Performance Task Rubric.
Assessment and Evaluation instruments utilized to measure accomplishment of each performance task are indicated and copies of each included.	Each perfo rmance task has at least one rubric that scores at or above the 75% level on the *Rubric for Scoring Rubrics* and includes an adequate number of other assessment instruments to measure student performance.	Each performance task has at least one rubric that scores at or above the 75% level on the *Rubric for Scoring Rubrics* but does not include sufficient other assessment instruments to measure student performance	Each performance task has at least one rubric that does not score at the 75% level on the *Rubric for Scoring Rubrics* but includes several other assessment instruments to measure student performance	Neither rubrics nor a sufficient number of other assessment instruments are included for measuring student accomplishment of performance tasks.
Pre-Post Testing Procedures for the Module are described and instruments attached.	Pre-Post Testing Procedures are comprehensive and reflect the objectives of the Module. Assessment instruments are attached.	Pre-Post Testing Procedures reflect the objectives of the Module, but the assessment instruments are not attached.	Pre-Post Testing Procedures are described, but not adequate to evaluate the effectiveness of the module.	Pre-Post Testing Procedures are not evident.

Lesson Order and Titles

Standard	Descriptor Level I	Descriptor Level II	Descriptor Level III	Descriptor Level IV
Titles for each lesson to be presented within the Module are listed in the order in which they are to be presented to the students and the corresponding ILS and/or District Curricular Benchmarks identified.	All Lesson Titles are listed in an order that is efficient and appropriate for achieving Module objectives and the corresponding *ILS and/or District Curricular Benchmarks* are accurately identified for each.	Lessons necessary for the achievement of the Module objectives are provided, but the *ILS and/or District Curricular Benchmarks* identified are inappropriate.	Some Lessons appear to be missing that are necessary for students to achieve Module objectives.	Lesson Titles and Benchmarks are missing.

Table 11.14 Module Rubric (continued)

Lesson Activities and Procedures for each lesson title listed:				
Standard	**Descriptor Level I**	**Descriptor Level II**	**Descriptor Level III**	**Descriptor Level IV**
The lesson contains a descriptive Lesson Topic	The Lesson Topic includes a statement that adequately describes the material to be covered in the lesson.	The Lesson Topic does not completely describe the material to be covered in the lesson.	The Lesson Topic statement is unclear.	No Lesson Topic is provided.
The lesson contains one or more Lesson Benchmarks.	Listed Benchmarks match ones taken directly from the *ILS and/or District Curriculum* (Technology Standards/Benchmarks can be taken from the ISTE Standards/Benchmarks) and reflect the content of the lesson.	Listed Benchmarks do not reflect the content of the lesson.	Listed Benchmarks are not taken from the *ILS and/or District Curriculum* (including ISTE Standards/Benchmarks).	Benchmarks are not listed.
An estimated Length of Lesson is provided for each lesson.	An estimated number of class periods and time is provided to complete all lesson objectives that seem appropriate to student level and lesson difficulty.	The estimated Lesson Length provided does not appear to match student ability level.	The estimated Lesson Length provided does not appear to match lesson difficulty.	No Lesson Length is given.
List of Materials, Equipment and Supplies necessary for students to complete lesson activities is provided.	A complete list of all necessary materials, equipment and supplies is present, and they reflect the lesson activities/procedures.	A list of materials, equipment and supplies is present, but obvious omissions are apparent.	The list of materials, equipment or supplies does not clearly reflect the lesson activities.	No list of materials, equipment or supplies is provided.
Student Assessment process is described and instruments used to measure accomplishment of lesson objectives are attached.	An adequate amount of well designed tests, quizzes, etc. are included to allow the teacher to periodically assess the progress of students and make instructional decisions.	Assessment process and/or instruments do not accurately measure the lesson objectives.	Assessment process or instruments do not adequately assess student progress.	No additional assessment instruments are included in this session.

Table 11.15 Module Rubric (continued)

Standard	Descriptor Level I	Descriptor Level II	Descriptor Level III	Descriptor Level IV
Activities and Procedures for each Lesson in the Module are described that allow teachers to design daily class activities.	All Lesson Procedures encompass all activities necessary for the expected time-frame and are comprehensive enough to make daily assignments.	Lesson Procedures contain necessary activities; however, additional Procedures are necessary to fully cover the activities in the Module.	Ample Lesson Procedures are present; however, several of them are not comprehensive enough to make daily assignments.	An insufficient number of Lesson Procedures are included, and most lack significant depth required to teach the activities.
Activities and Procedures for each Lesson in the Module include the teaching model(s) and level(s) of Bloom's Taxonomy.	Teaching models and levels of Bloom's Taxonomy are accurately reflected in the lessons.	Teaching models are listed but do not accurately reflect the lessons.	Levels of Bloom's Taxonomy are listed but do not accurately reflect the lessons.	Teaching models and/or Levels of Bloom's taxonomy are missing.
Activities and Procedures include at least one WebQuest lesson.	At least one of the Activities and Procedures includes a WebQuest lesson evaluated by the WebQuest rubric at 75%.	A WebQuest is included in the teaching activities but does not meet the 75% rubric criteria.	A WebQuest is included in the teaching activities but does not meet the 50% rubric criteria.	No WebQuest is evident in the Activities and Procedures.
Activities and Procedures include the use of technology by the teacher and the students.	The use of technology by the teacher and the students is evident and comprehensively described in the lessons.	The use of technology by the teacher and the students is evident but not comprehensively described.	The use of technology is limited to either the teacher or the students and not both.	The use of technology in the lessons is not evident.

Table 11.16 Module Rubric (continued)

Student Activities: All entries in this section must be written in a voice that is addressing the student				
Standard	**Descriptor Level I**	**Descriptor Level II**	**Descriptor Level III**	**Descriptor Level IV**
Lesson Number and Title, Topic, and Benchmarks match those in the Lesson Activities and Procedures Section.	The Lesson Title, Lesson Topic and Lesson Benchmarks match those in the previous Module section.	The Lesson Title, Lesson Topic and Lesson Benchmarks mostly match those in the previous Module section.	The introductory sections in the Student Activities somewhat match those in the Lesson Activities and Procedures.	This section is not completed.
The Student Activities contains a description of What is this lesson About written in a form that students can comprehend.	This section contains a paragraph or two communicating to the students what they will learn, is written in non-technical terms, and piques student interest.	This section adequately communicates Lesson outcomes but is not written in a way to pique student interest.	This section does not adequately communicate Lesson outcomes nor does it pique student interest.	This section is not completed.
The section describing What You are Going to do Today is comprehensive enough for students to follow.	This section describes the activities that will be taking place and includes several interesting and tantalizing descriptions aimed at motivating students. This is written in a fashion that is easy for students to follow and refers to instructional material, worksheets, equipment, textbooks, etc. that are to be used. If investigative questions are to be answered, they are to be listed here as well.	This section comprehensively describes the activities that will be taking place, but is not written in a way to peak student interest.	This section is not complete enough for students to follow nor does it pique student interest.	This section is not complete.
All Student Artifacts to be collected from students are indicated.	Artifacts checked are reflected in the activities described in the "what are you going to do today" section.	Artifacts checked are NOT reflected in the activities described in the "what are you going to do today" section.	Artifacts are not checked nor do they exist in the description of student activities.	This section is not complete.
Assessment Procedures to be distributed to students prior to instruction are identified, described, and attached.	Assessment Procedures, which include how student artifacts are to be assessed, are described in student understandable terms and attached (ready for distribution to students).	Assessment Procedures are not completely described and not ready for student distribution.	Assessment Procedures are not described in student understandable terms and are not ready for distribution.	Assessment Procedures are not complete or attached.

Comments Title of Module: _____ Name(s) of Module Designers: _____ Team Name: _____ Date: _____

Table 11.17 Alternate Module Rubric

Instructional Module Introduction
Standard: A Brief Description of Module is provided that outlines the activity being undertaken by students participating in the module.
Level Descriptor
a. A concise paragraph describing the activity in the module is provided.
b. More detail is needed to adequately portray the module.
c. No description of the module is provided.
Standard: The Purpose and Rationale clearly describes the reasons for including the Module in the curriculum.
Level Descriptors
a. The purpose and rationale for module content explain its importance both in school and in life.
b. The purpose and rationale for module content are not related to both school and life applications.
c. The purpose and rationale for module content are not related to either school or life applications.
d. The purpose and rationale for module are not sufficient to warrant its inclusion in the curriculum.
Standard: Related State Learning Standards are identified that describe minimum levels at which students are expected to attain after completing the activi ties in the Module. *Level Descriptors*
a. A Standard from the *Illinois Learning Standards* is identified for each of the content areas integrated into the module.
b. Standards are listed for some, but not all, subject matter areas.
c. Standards from the *Illinois Learning Standards* are not identified.
Standard: Each Interdisciplinary Content Area Involved in the Module is identified and the topic areas from each are listed. *Level Descriptors*
a. Each school subject area (course) integrated into the Module is identified and topic areas are listed.
b. Each school subject area (course) integrated into the Module is identified but topic areas are not listed.
c. One or more of the subject areas have been omitted.
Standard: Ways that Industrial Partnerships are utilized are described that enhance the instructional activities within the Module.
Level Descriptors
a. Multiple examples of student activities utilizing the resources provided by industrial partnerships are described that enhance the Module
b. One or two examples of student activities utilizing the resources provided by industrial partnerships are described that enhance the Module.
c. Examples of uses of industrial partnerships are listed but not fully described.
d. No examples of the uses of industrial partnerships are described.

Table 11.18 Alternate Module Rubric (continued)

Standard: <u>Specialized References and Vendors</u> are listed that are specific to the activities contained in the Module (if there are no specialized references and vendors needed in the module, type "none")
Level Descriptors
a. A complete list of specialized references and/or vendors is provided for each activity contained in the Module.
b. No specialized reference list is provided.
Standard: <u>Teaching Models</u> employed within the Module have been identified.
Level Descriptors
a. All Teaching Models employed within the Modules are identified.
b. Some Teaching Models used have been omitted or some that are identified are not employed in the Module.
c. No Teaching Models have been identified.
Standard: The <u>Model(s) of Curricular Integration</u> employed within the Module is/are identified and graphic organizer is attached.
Level Descriptors a. The Model(s) of curricular integration have been identified and graphic organizer is attached b. The Model(s) of curricular integration have been identified but no graphic organizer is attached c. Model(s) have not been identified. **Standard: <u>Technology Utilized</u> in the Module activities has been identified.** *Level Descriptors* a. The Technology Utilized within the Module has been identified. b. The Technology identified has either not been utilized in Module activities or Technology described in lesson activities have not been identified. c. Technology has not been identified. **Standard: <u>Web Sites</u> are identified which relate to module activities.** *Level Descriptors* a. At least one web site is identified that is related to module activities. b. No web sites have been identified. **Standard: The levels of *Bloom's Taxonomy of Objectives* are identified.** *Level Descriptors* a. The frequency of use for each Bloom's level is identified and correctly relates to the module activities. b. One or more Bloom's levels checked does not relate to the module activities. c. No Bloom's levels are checked. **Standard: <u>Opportunities for further interrelated activities with additional fields or disciplines are described</u>** *Level Descriptors* a. At least one opportunity is suggested and described that might be employed by others using this module. b. No opportunities are suggested. **Standard: The Module includes at least 2 Performance Tasks with assessments.** *Level Descriptors* a. Module contains at least two performance tasks with assessments. b. Module contains at least two performance tasks, but some or all of the assessments are missing, c. Module contains less than two performance tasks with assessments. d. Module contains less than two performance tasks but some or all of the assessments are missing **Standard: Module includes a pretest-posttest.** *Level Descriptors* a. A pretest -posttest is attached. b. No pretest-posttest included. <u>Master Schedule of Lesson Activities</u> **Standard: Lesson topics are scheduled by week/date and content areas in the order in which they are presented to students.** *Level Descriptors* a. All content areas, lesson topics, and week/dates are listed, b. Some content areas, topics or week/dates are missing. c. All content areas, lesson topics, and week/dates are missing.

Table 11.19 Alternate Module Rubric (continued)

Lesson Activities and Procedures For each lesson title listed:

Standard: The lesson should contain a descriptive Lesson topic.

Level Descriptors

a. The Lesson Topic should include a statement that adequately describes the material to be covered in the lesson.

b. No Lesson Topic is provided or it does not describe the lesson material.

Standard: The lesson contains one or more Lesson Benchmarks/District Objectives.

Level Descriptors

a. Each benchmark/objective listed matches one taken directly from the ILS and/or District Objectives.

b. Not all of the listed benchmarks/objectives match those in the I.L.S. and/or District.

c. None of the benchmarks/objectives listed are taken from the I.L.S. and/or District

Standard: An estimated Length of Lesson is provided for each lesson.

Level Descriptors

a. An estimated number and length of class periods is provided that seem appropriate for the content.

b. The estimated number and length of class periods provided seem inappropriate for the content.

c. No Lesson Length is given.

Standard: A list of Materials and resources necessary for students to complete Module activities is provided

Level Descriptors

a. A complete list of all necessary materials and resources is present.

b. A list of materials and resources is present, but obvious omissions are apparent.

c. No list of materials and resources is provided.

Standard: All Student Products to be collected from students are indicated.

Level Descriptors

a. Each Product required is checked.

b. One or more Products are checked that are not indicated in other Lesson Activities.

Standard: Module contains traditional and authentic instruments used to assess student products and/or process(es).

Level Descriptors

a. Traditional and authentic instruments are attached that assess student products and process(es).

b. Traditional and authentic instruments are attached that assess some student products and process(es).

c. Most assessment instruments attached are traditional in nature.

d. No assessment instruments are included in this section.