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Karen E. Gable Ed.D.  
*Indiana University*

Beverly A. Ransdell B.A.

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Analysis of a Health Occupations Education Model  
of Integrated Academics

Karen E. Gable<sup>1</sup>

Beverly A. **Ransdell**

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Abstract: The integration of academics **and** occupational education is a concept supported by the business community, vocational educators and state and federal policy makers. The 1990 Carl Perkins Amendments required federal moneys to be spent on **programs** that integrate academic and vocational education course sequencing, so that students achieve both academic and occupational **competencies** (Section 235). This study analyzed the process and product of courses developed within a secondary **Health** Professions Center magnet program **in** Indiana against the elements of success as outlined by **Statz and Grubb** (1991) and **Pritz** (1989).

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<sup>1</sup>Karen E. Gable, Ed. D. is Assistant Professor, Health Occupations Education at the Indiana University, School of Education, **IUPUI** campus in Indianapolis; Beverly **Ransdell**, BA, **Biology and Chemistry**, is a teacher at the Health Professions Center, Arsenal **Technical** High School, Indianapolis Public Schools, Indianapolis, IN.

### Conceptual Framework of the Project

Academic and vocational education **are** increasingly the foci of external as well as internal accountability pressures. Reduced enrollments, increased secondary **graduation** requirements, and high dropout and **illiteracy** rates have led to **recognition** that the **integration** of vocational and academic education offers an opportunity to foster change in an educational system that is in need of reform.

Federal legislation, such as the Carl D. Vocational and Applied Technology Education Act and its subsequent amendments, and the national attention to the Goals 2000 effort have **led** to increased attention to a closer relationship between the academic and occupational preparation of students. Section 235 of the Perkins Amendments specifically requires that federal moneys will be directed to the integration of the dual structured educational system.

A new vision of vocational education is emerging. **According** to Mark **Musick**, cooperation between academic and vocational teachers, increased **collaboration between** the business/industrial arena and **all** levels of the educational system, quality technical education and learning, and enhancement of the academic preparation of students **are** factors in this evolution. **Musick** states:

Literally thousands of persons...now have a new vision of vocational education.

Unfortunately, in too many high schools, the vocational curriculum **is** out of step **with** the nation's high tech, **information-based** economy. The emphasis is on learning to perform a specific task or use a certain piece of equipment. Not enough time is devoted

to helping students acquire a broad technical and academic foundation for effective problem-solving decision-making, and **communication** at the worksite.

(Bottoms, 1993, p. vii)

National efforts have **been initiated**, such as **the** State Vocational Education **Consortium** of the Southern Regional Education Board (**SREB**), a group of school sites and systems in 19 states. Originating in 1987 with 28 pilot sites, the **Consortium** has expanded rapidly and now includes some 300 sites (Bottoms, 1993). According to Bottoms, **SREB** was formed to “develop, apply, evaluate, and advance approaches to strengthen students’ basic **competencies** in communications, mathematics, and science, and their critical thinking and problem-solving abilities” (Bottoms & Presson, 1989, p. vi). **SREB** worked with vocational education, business and industry, and government leaders in an effort to improve general academic and vocational education in the high school setting. In its research efforts, over twenty-five schools were studied, approximately 2,700 high school transcripts **were** reviewed, and over 1,700 vocational students were involved in a one year post-completion follow-up study. The research report of the **SREB** recommended raising the academic and technological literacy of graduates of secondary education.

Nine **key practices** of the Consortium’s Making High Schools Work program include:

1. establishing high expectations for students in vocational and academic courses;
2. developing and revising occupational courses to emphasize mathematics, science, communication and problem-solving skills;
3. developing and revising academic courses so as to teach concepts via functional and applied strategies;

4. requiring students in occupational and general studies to complete a challenging educational **program** including college prep equivalent credits in math, science, and a **vocational major**;
5. encouraging academic and vocational teachers to integrate curriculum and instruction;
6. revising instructional processes to increase students' active engagement
7. providing guidance and counseling services to aid students in identifying future goals and a planned program of study;
8. providing extra assistance to students in completing the challenging **program**; and
9. participating in program evaluation which includes student assessment data which can then be used for curriculum revision (Bottoms, 1993).

Efforts in various states have led to the adoption of a curriculum of academics in which academic and vocational teachers have worked together as a team to develop curricula. The Indiana State Legislature enacted Senate Bill #419 in February of 1993, which requires the implementation of Tech Prep, an articulated secondary/post-secondary educational program intended to provide students with opportunities to develop basic academic as well as occupational skills in a seamless educational ladder. Pilot sites are developing and implementing self-designed programs with the approval of the Indiana Department of Education. Concurrently, the Indiana Department of Education has become a member of **SREB** and is involved in four pilot sites within the state. As a result, administrators and educators in Indiana secondary schools are involved to varying degrees in educational reform, some of which is state mandated and some of which is **self-initiated**.

A variety of practices and approaches are **being** initiated in schools across the United States. These approaches have varying goals, desired outcomes and purposes. **Grubb**, Davis, Lum, **Plihal**, and Morgaine (1991) **identified** eight integration models. These models suggest various ways to approach educational **reform** and may be **modified**. Benefits and limitations exist for each model and should be considered **seriously** prior to choosing a particular one to use. The descriptive model titles, as presented by **Lankard** (1992) are as follows:

1. incorporating more academic content into **vocational** courses;
2. combining vocational and academic teachers to enhance academic **competencies** in vocational **programs**;
3. making academic courses more vocational relevant;
4. curricular alignment modifying both vocational and academic courses;
5. the senior project as a form of integration;
6. the Academy model;
7. occupational high schools and magnet schools; and
8. occupational clusters, career paths and occupational majors.

#### Description of the **Program**

The School of Health and Human Services operates within the Indianapolis Public School (**IPS**) System, which has an enrollment of approximately 46,000 students. The Health Professions Center (**HPC**) is part of the School of Health and Human Services and offers three levels of preparation in four career tracks to its 250 students yearly. These options include career exploration in the fields of allied health, nursing, dentistry, and medicine.

The faculty of HPC, consisting of five **members**, is part of the larger 15 member **math-science and HPC magnets' faculty group** of Arsenal Technical High School. This high school is one of seven high schools within the **IPS** system and has approximately 200 faculty members.

The **IPS** system is involved in restructuring its **organization** and in pursuing innovative educational reform. Adherence to Indiana's requirements for Performance Based Accreditation (**PBA**) allows individual schools to establish outcomes for students, faculty and **administrators**. PBA facilitates the active participation of educators in **establishing** these expectations and developing and implementing curriculum.

#### The Process of the **Integrated Academic Curricular Development**

A variety of reasons triggered interest in the **integration** of the science and the health occupations education (HOE) courses. Students lacked the science knowledge for **problem-solving** at the job sites. Generally, occupational educators have been criticized for focusing upon **specific** knowledge and skill training perceived to be required for student preparation for the work world. Moreover, science teachers as well as academic teachers have been criticized for not providing participatory instructional strategies and **opportunities** for students to perceive the linkages between content and the real world (**Grubb** et al. 1991). Additionally, business and industry have argued that schools are not preparing students who have the necessary skills for working in a global economy, e.g. higher order thinking, problem-solving, communication, and longevity. These reasons precipitated an interest in developing and implementing a health occupations education curriculum to prepare students for future career entry.

### Development Tenets

From the beginning in 1987, certain basic beliefs guided the process of curriculum development. These beliefs reflected the professional attitudes and values of the educators and administrators involved, and resulted in the following principles which guided the Curricular development:

1. The curriculum product must adhere to **state** curriculum proficiencies in the areas of science and **health** occupations education.
2. The curriculum should reflect basic concepts of exposure, **re-enforcement**, and enhancement.
3. The developmental effort should involve teachers from both the areas of science **and** health occupations education.
4. The implementation of the curriculum should be based on a feasible time **frame**, personnel, equipment and supplies, etc.
5. The curriculum **should** be implemented within two years of development.

### Developmental Stem

The first step in the development process was to investigate the concepts and skills in the existing HOE **curriculum**. Next, studies examined state proficiencies for health education and science, specifically, biology and **chemistry**. After listing both the state health education and science proficiencies and HOE concepts and skills, the matching process took approximate] y six months. There were areas which did not match--for instance **medical** terminology and the biological classifications. **In** this case, the science and **HPC** courses operated independently.

The third step included the development of goals and objectives by two of the science and HPC teachers. Following this development, the teachers created activities congruent with the student goals and objectives. The activities **were** derived **from** a wide **variety** of sources such as existing lab manuals, reference materials, clinical lab **procedures**, and teachers' creative efforts. The fifth step was to develop a syllabus which listed each day's activities. Finally, needed materials were ordered in **preparation** for curriculum implementation. Steps **three** through six were completed in approximately a one month period of intensive effort on the part of the two teachers.

In the summers following the **first** and second years of implementation (1988 and 1989), extensive revisions were undertaken. The reasons for these changes included the need for smoother implementation, improvement of activities, and more extensive inclusion of affective domain activities and evaluation. The third summer's (1993) revisions focused upon **identification** and evaluation of student outcomes at the completion of first, second, third and fourth years of health occupations education. Computer assisted instruction has been developed and was implemented in the **Fall**, 1993.

#### Description of the **Integrated** Curriculum Product

The Curricular product is a course description and list of goals for **Integrated Human Studies I and II** while the second year courses are **identified** as **Integrated Human Studies III and IV**. The goals include "to integrate biology concepts with those of Health Professions, to provide students with the knowledge, attitudes and skills **needed** to progress to the sophomore **level** of Health Professions, to **fulfill** the state biology and health

Gable and Ransdell: Analysis: Health Occupation Education Model Integrated Academics education requirements for **graduation**, and to provide hands-on experience in many of the basic procedures utilized in various health care fields” (Wegner and Ransdell, 1992, p. 1).

Course objectives for the Integrated Human Studies I and II are as follows: The students should be able to:

1. acquire knowledge of the structure and function of the human **body**;
2. relate the effects of various diseases on body systems;
3. display behaviors which lead to a healthy lifestyle;
4. master recognition of **prefixes**, roots and suffixes of medical terms;
5. use animal dissections to develop skills of investigation and observation;
6. be aware of professional behaviors displayed by members of the **health** care team;
7. develop skills needed at work as a health care team member; and
8. understand the structure and function of plants and animals (Wegner and Ransdell,

1992, p.1).

Specific unit and lesson objectives are more detailed and are created and implemented by individual faculty members.

The curriculum guide includes instructional methods, a **list** of **textbooks** and **materials** required, and a listing of course topics for each class. The syllabus is a vital component of the guide and reveals the total integration of the science (biology and chemistry) and HOE concepts. Activities identified on the syllabus list objectives, materials, procedures, and method of evaluation. Faculty members are encouraged to develop appropriate instructional strategies when specific activities are not **identified**.

Science and HPC teachers meet weekly to discuss the effectiveness of the activities, changes which need to be made, student discipline, and student development. Although courses are not team-taught, close cooperation and elaboration between the teachers is a critical component of implementation of the integrated courses.

Back-to-back classes were initially attempted because of the belief they would provide the optimum learning experiences. However, courses are now offered **separately because** of extreme scheduling **difficulties** within the high school.

### Examples of Integrated Concepts

One example of **integrated curriculum** is found in biology and **HPC** courses. A biology unit on the circulatory system teaches students to identify names and functions of system parts. **In** the **HPC** class, students **learn** the medical terms that relate to those parts, **as** well as diseases, dysfunctions, and maintenance of the **circulatory** system. This unit addresses both the state high school science and health education proficiencies of identifying and describing the functions of body systems.

Similarly, an integration of chemistry and health professions is illustrated in the unit on "Observation and Measurements." In chemistry, the student practices metric measurement of volume, length, and mass. The unit also involves qualitative and quantitative observations of the chemical reaction which occurs when a candle burns. Additionally, the chemistry student learns to convert between metric units. In the **HPC** class, these same objectives relate to the health field. The student will again be working with length (height), volume (**input/output**), and mass (weight), and will learn the differences between qualitative and quantitative

observations of patients. Practice of dosage calculations and conversions between metric and apothecary units complete the unit objectives.

### Analysis of the Integrated Curriculum

The curricular developmental process and product **are** a blend of four models of integration **identified** by **Grubb** et al., 1991. **Specifically**, models focusing on teachers, curricular alignment, occupational and magnet **schools**, and **occupational** clusters **as** previously **discussed**, provided elements which form the basis of the integrated curriculum developed at the Health Professions Center. The **HPC** curriculum requires the vocational and academic teachers to enhance academic competencies in the HOE programs. This collaboration and cooperation of the science and HOE teachers **exemplifies** one aspect of the Grubb models. Modification of vocational and academic **courses** provided the structure for the HPC curriculum endeavor. The Curricular product was evidence of an effort to sequence learning experiences that allow students to build logically upon prior knowledge. Extensive cooperation between academic and vocational teachers was critical to the development and implementation of the curriculum. The **program** is situated in a magnet high school and is identified within the School Of Health and Human Services, and therefore is characteristic of yet another **Grubb** model. The total Curricular design **incorporates** the concepts of occupational clusters and career paths. Students can prepare for entry-level employment, technical training, or post-secondary higher education in a variety of occupational fields. Students are encouraged to explore career opportunities as early as the sophomore **level**.

In an effort to analyze the success of the curricular process and product, the elements of success as **identified** by **Statz** and **Grubb** (1991) and **Pritz** (1989) were selected as criteria upon which to base **judgement**. These elements include the following:

1. vision and commitment from all levels,
2. consistent support **from** district administrators and state officials,
3. new resources for funding,
4. autonomy for teachers,
5. teacher training and restraining,
6. evaluation of efforts, and
7. adequate time for implementation.

Using these criteria, the HPC efforts to **integrate** academic and vocational education were viewed as **successful**. Initially resources were abundant as evidence of district commitment and support. Teachers were allowed a great deal of freedom **in** lesson objectives and in identifying problems which needed to be corrected in the existing curriculum. Additionally, they were encouraged to continue their education through HOE certification and degrees, professional vocational associations, and workshop attendance. Teachers were given professional leave time to attend workshops and meetings. Constant evaluation of the **program** effectiveness was conducted through formal and informal discussions. Adequate time was provided to develop and implement the **program**.

Not **all** criteria were met successfully. While administrators acknowledge the importance of the program's existence, operative **needs** of the **program** are not always

Gable and Ransdell: Analysis: Health Occupation Education Model Integrated Academics recognized. Severe funding **difficulties** within the Indianapolis Public School system could be a critical factor in this lack of **recognition**.

#### Conclusions. Implications and Recommendations

In conclusion, the curricular process and product developed by the Health Professions Center was a combination of several integration models. The blend was **appropriate** for the given situation of the magnet school concept, the educational **reform** integration efforts and the resources of the school system.

The curricular development activity was successful in comparison to the elements of success as identified. Two of the elements were perceived to be vital in the success. These included the professional autonomy of the teachers and the administrative support of continuing teacher education. In addition to the elements discussed above, a crucial element in the development and implementation appeared to be the teachers' willingness to cooperate and collaborate.

The implications of the Curricular changes are reflected by increased student learning. Students have become more aware of how academics relate to their **health** career choices. This connection results in better performance in their academic as well as **HPC** subjects. Additionally, the sequencing of the topics and experiences have provided a more logical framework within which student learning occurs. Because this integrated curriculum is outcome based, students, teachers and administrators are aware of expectations and achievement of goals. Finally, data of student graduates show that all are either employed in a health care field or are enrolled in a college or university,

Continuous curricular evaluation and revision **are** highly recommended. The Curricular process and product accomplished by the Health Professions Center should be considered as a potential model for other systems. The model appears to meet the intent of Roy Peters, a leading proponent of new and **revised** secondary vocational education, who states, "We must provide quality education to our career-bound youth. Our **goal** is to ensure that all vocational students are prepared for the workplace and **further** education. It is not an either/or situation" (Bottoms, 1993, p. 6).

The elements of success provided a valid **framework** for analysis. However, student achievement should be included as a criterion for judging success. Additionally, it is recommended that teacher **cooperation** and collaboration also **be** included as an element for analyzing a successful model of integrating academic and vocational education.

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