DOCUMENT RESUME

ED 296 131 CE 050 415

AUTHOR Owens, Thomas R.
TITLE Improving the Collaboration of Secondary Vocational and Academic Educators.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE Apr 88
CONTRACT 400-86-0006
NOTE 19p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Education; *Articulation (Education); Case Studies; *Cooperative Planning; *Educational Cooperation; *Interdisciplinary Approach; School Role; Secondary Education; Teacher Role; *Vocational Education; Vocational Education Teachers
IDENTIFIERS Idaho; Oregon

ABSTRACT

A study examined two projects designed to foster increased collaboration between secondary vocational and academic teachers. The first, called the Basic Skills Project, aimed at facilitating more effective cooperation among Idaho secondary school academic and vocational teachers to reinforce student mastery of basic skills. A part-time state project director worked with five teams of high school vocational and academic educators, providing in-service training and technical assistance in developing mechanisms to increase collaboration. The second project studied was an extensive curriculum revision project at Benson Polytechnic High School in Portland, Oregon. Semistructured interviews with key staff and other teachers, observations, analyses of project documents, and a levels-of-concern instrument were used to study the two projects. In the second year of the Idaho project, the staff from the five pilot sites served as resource people for five new sites, thus continuing to build on the collaboration that had developed at the original project sites. The Oregon curriculum revision project was similarly well received and generally successful. The study resulted in a framework for teacher cooperation, according to which teacher cooperation is necessitated by environmental influences, is enhanced by state-level and local administrative support, and results in tangible benefits to teachers and students. (This report also identifies barriers to and principles enhancing cooperation and illustrative practices.) An 11-item reference list and an annotated bibliography are also included. (MN)

IMPROVING THE COLLABORATION OF SECONDARY VOCATIONAL AND ACADEMIC EDUCATORS

Prepared by

Thomas R. Owens
Education and Work Program
Northwest Regional Educational Laboratory
101 S.W. Main Street, Suite 500
Portland, Oregon 97204

Paper presented at the annual meeting of the American Educational Research Association in New Orleans, LA.

April 1988

This publication is based on work sponsored wholly, or in part, by the Office of Educational Research and Improvement (OERI), Department of Education, under Contract Number 400-86-0006. The content of this publication does not necessarily reflect the views of OERI, the Department, or any other agency of the U.S. Government.

Improving the Collaboration of Secondary Vocational and Academic Educators

This paper addresses a critical issue for leaders in both education and business today who are concerned that many of our high school graduates are entering the labor force with inadequate academic and employability skills. Employers express a strong belief that all graduates should leave high school properly prepared for immediate employment or further education (National Alliance of Business, 1986).

What role is vocational education to play in the years ahead? How can excellence be achieved in vocational education and how can it contribute to enhancing the total school reform for today's youth, especially those who aspire to occupations which do not require baccalaureate degree level training? One thing seems certain. Vocational education cannot continue as an isolated part of a secondary curriculum that focuses narrowly on specific job skill preparation. Instead it must be integrated with academic education to create well-rounded individuals who can continue to grow and learn the rest of their lives.

In this paper I will: 1) review the purposes for this study of teacher collaboration; 2) describe the sites selected; 3) summarize the case study design and key questions; and 4) report some of the findings.

Purposes and Conceptual Framework

The Northwest Regional Educational Laboratory (NWREL) is engaged in a long-term effort to study effective vocational education. After reviewing the literature on effective schooling practices and their implications for vocational education, the NWREL staff met with our regional advisory committee to outline alternative approaches to guide our study. The approach chosen was to identify two or three systematic attempts to improve collaboration between secondary vocational and academic teachers and to conduct case studies on how the improvement was brought about, what contributed to the success, factors that limited success, and strategies used to overcome these obstacles. The purposes then were to conduct descriptive case studies and generate some guiding principles that could be applied by educators and policymakers.

The conceptual base for designing and carrying out the case studies was drawn from five different fields: 1) change theory with special emphasis on the Concerns-Based Adoption Model; 2) essential practices in vocational education articulation; 3) new research on collaboration; 4) strategic planning; and 5) principles of negotiation. The key points from these five fields are described in a separate report (Owens, 1987).

Site Selection and Description

A case study site was selected in Idaho and Oregon. Both sites involve vocational education and academic teachers working together.

Idaho

In Idaho, NWREL studied a new Basic Skills Project aimed at facilitating more effective cooperation among Idaho secondary school academic and vocational teachers to reinforce student mastery of basic skills through application in vocational education programs. The project is a joint venture of the State Department of Education and the State Division of Vocational Education. A part-time state project director was hired to initiate project inservice, coordination, and technical assistance. In the first year she worked with five high school teams of vocational and academic teachers from around the state in improving basic skills and self-esteem of vocational students. Each team generally involved the principal, an English and math teacher, and several vocational teachers. The teams participated in a one-week summer in-service and meet as a total project several times a year. Four of the project sites were senior high schools and one was a junior high. The researcher spent several days over two years in interviews and observations at Weiser High School and at Hillside Junior High School in Boise. These two schools were selected to represent the operations at a rural senior high school and an urban junior high. The overall project coordination was guided by a six-person Task Force involving members of both the Department of Education and the Division of Vocational Education.

Oregon

The Oregon project selected was an extensive curriculum revision project at Benson Polytechnic High School in Portland. The curriculum revision will take five years for successful implementation. Benson has operated as a vocational/technical school for many years. In 1986, the principal and staff prepared a comprehensive school improvement plan that called for the revision of the curriculum to make it more responsive to the changes in our technological society. Less emphasis is placed on specific occupational preparation and greater emphasis on providing young people with a sound technological background that will apply across most jobs. As part of this plan, they are having the academic and vocational teachers work more closely together in developing a broad-based curriculum. Both academic and vocational teachers are involved in planning and teaching the curriculum. Four years of English/communications are required as well as four years of math and science although the types of courses in each track can vary.

Study Design

The design of these case studies was based on the conceptual framework already mentioned, and centered around four types of data collection over a two year period: 1) semi-structured interviews with key staff, steering committee members, and other teachers in the building; 2) observations of project staff meetings and classroom observations; 3) collection and content analysis of project documents including meeting minutes, newspaper articles and progress reports; and 4) use of a levels-of-concern instrument for identifying potential areas of staff concern or resistance.

The basic areas covered in the case study interview questions were the problems and opportunities leading to the innovation, alternatives considered, purposes and objectives for the project, key situations or factors facilitating or hindering the project, state or local policies that helped or hindered the process, key people involved and their roles, outside agencies or individuals involved, costs, description of the project operations, principal's role, expected and actual impact on students, ways in which vocational and academic teachers worked together and how this cooperation changed, and outcomes of this cooperation.

A levels of concern survey was developed and used in both sites focusing on attempts at improving the cooperation of academic and vocational teachers. Based on the work of Hall and Locks (1978 and 1981) and Pratt, Thurber, Hall and Hord (1982), we used a full page open-ended question asking teachers about concerns related to the project. Responses were analyzed using the hierarchy of six levels of use ranging from orientation to renewal. In addition, we met with the steering committees to identify 17 specific areas of possible concern such as "I'm worried that the changes will require extensive retraining for me." These 17 statements were put on a Likert five-point rating scale ranging from "strongly agree" to "strongly disagree" with an additional option being "inadequate information to be able to respond."

Summary of Findings

This section begins with a brief description of the project operations in the two states and is followed by an emerging framework for cooperation, perceived barriers to cooperation, principles enhancing cooperation, and some illustrative practices found.

Idaho

Five schools were selected to participate in the Idaho Basic Skills Project out of 10 district applicants. Four high schools were involved--Jerome, Lapwai, March Valley, and Weiser. The fifth school was Hillside Junior High School in Boise. The NWREL staff decided to focus the case study on the state level task force and the program implementation at Weiser High School and Hillside Junior High in order to get a sense of the overall planning and coordination as well as an insight into its operation at the junior and senior high level in Idaho.

The state level task force consisted of the project director, math and language arts representatives from the Department of Education, Director of the Division of Vocational Education, a special needs supervisor in the Division of Vocational Education, and an outside consultant who was a former employee of the Division of Vocational Education.

Prior to the formation of the Basic Skills Project, there was relatively little interaction between staff in the two state agencies (Department of Education and the State Board for Vocational Education). In the high schools, there was generally a division between academic and vocational education. Increased nigh school core requirements had reduced student options for taking vocational education and there had been turf questions over awarding academic course credit for certain basic skills taught in vocational education. These concerns, plus the pressure from business people in the state who claim many entry-level employees are lacking in basic skills, influenced the Division of Vocational Education to initiate this project to improve basic skills for vocational education students by having teams formed in the participating schools to help academic and vocational teachers work together.

At Weiser, the cooperation of academic and vocational teachers was rather high even before the Basic Skills Project. Staff felt this was due partly to the small size of the faculty and the professional attitude of the staff, many of whom are working on an advanced degree. The Weiser planning team involved the principal, business education, home economics, English and agricultural education teachers. The team decided to focus on increased student basic skills and self-esteem. The broader faculty advisory committee has picked up on these themes.

An important aspect of the Basic Skills Project has been the one-week summer training institute for all Project team members. The local teams then attempted to bring back what was learned to share with the total faculty. In addition to the team teachers working to improve basic skills of all students, they selected some specific at-risk youth who were taught by more than one team teacher as the basis for case studies. The team worked collectively to improve self-esteem and kept a file on each targeted student to include a collection of the students' writing and pre- and posttest basic skills. The staff met regularly to exchange information about these students.

The NWREL levels of concern questionnaire was administered to the 14 teachers most directly involved with the Project at Weiser. The only open-ended concern expressed by three or more teachers dealt with a lack of specific details about how the project would be implemented. Nine of the 14 teachers strongly agreed with the purposes of the project, three agreed and one indicated insufficient information. Only three teachers, however, felt there was adequate time being allowed for administrators and teachers to work on the project.

At Hillside Junior High School the Basic Skills team consisted of the principal and teachers of English, math, reading, industrial arts, and home economics. Hillside has the largest percentage of low income students of the six junior highs. Many of them get very little or no support at home.

The project objectives at Hillside were: improved student goal-setting and clarification, improved self-confidence, problem solving, motivation to apply basic skills, and increased student ability to identify their own success.

Because of the lack of a common teacher planning time for the team during the school day, the team met at least monthly at 7:15 a.m. Although the school enrolls students in grades 7-9, the principal decided to keep the project at the 7th and 8th grade level so that team teachers would be sharing the same high-risk youth across their classes.

In the second year of the Basic Skills Project, the staff from the five pilot sites served as resource people to five new sites that began. This exchange continued the collaboration that had built up within schools. An administrator's guide is available on how to set up a basic skills team (Radcliff, 1987).

Oregon

Benson Polytechnic High School's five-year plan for program improvement was intended to move vocational/technical instruction away from traditional, craft-centered approaches toward a generalized systems approach that helps students succeed in the work force and in further education.

One vice-principal, was released full-time in the first year to head up the curriculum revision process. The curriculum committee at Benson consisted of approximately 15 academic and vocational teachers, a counselor, vice principal and principal. Some members reviewed national studies and visited exemplary programs in Minnesota, Texas and California. They developed a comprehensive four-year outline and started work on a 9th grade curriculum which includes a blending of academic and vocational courses (Matarazzo, 1986).

The NWREL researcher participated in several curriculum committee meetings, interviewed the project director, and administered and analyzed a levels-of-concern instrument based on the curriculum revision project. The staff survey was completed by all 30 teachers at Benson. As with the teacher survey for Weiser High School, the first part of the survey contained the open-ended question about project concerns and the second part contained 17 statements with a Likert scale of "strongly agree" to "strongly disagree."

Most of the teachers supported the purposes of the curriculum revision and felt it would be good for Benson. Only seven teachers were worried that the proposed changes would affect their job security and 11 worried that the changes would require extensive retraining.

From a concerns base, teachers felt inadequate time was being allowed to work on the project, that they wanted greater involvement, and that more teachers be involved in the steering committee. Also, some of the teachers expressed the belief that the prior program was good and merely needed inprovement rather than a major overhaul.

FRAMEWORK FOR COOPERATION

A conceptual framework, such as that shown in figure 1, can be useful in identifying the factors that influence cooperation between academic and vocational teachers and the student and teacher benefits resulting from it.

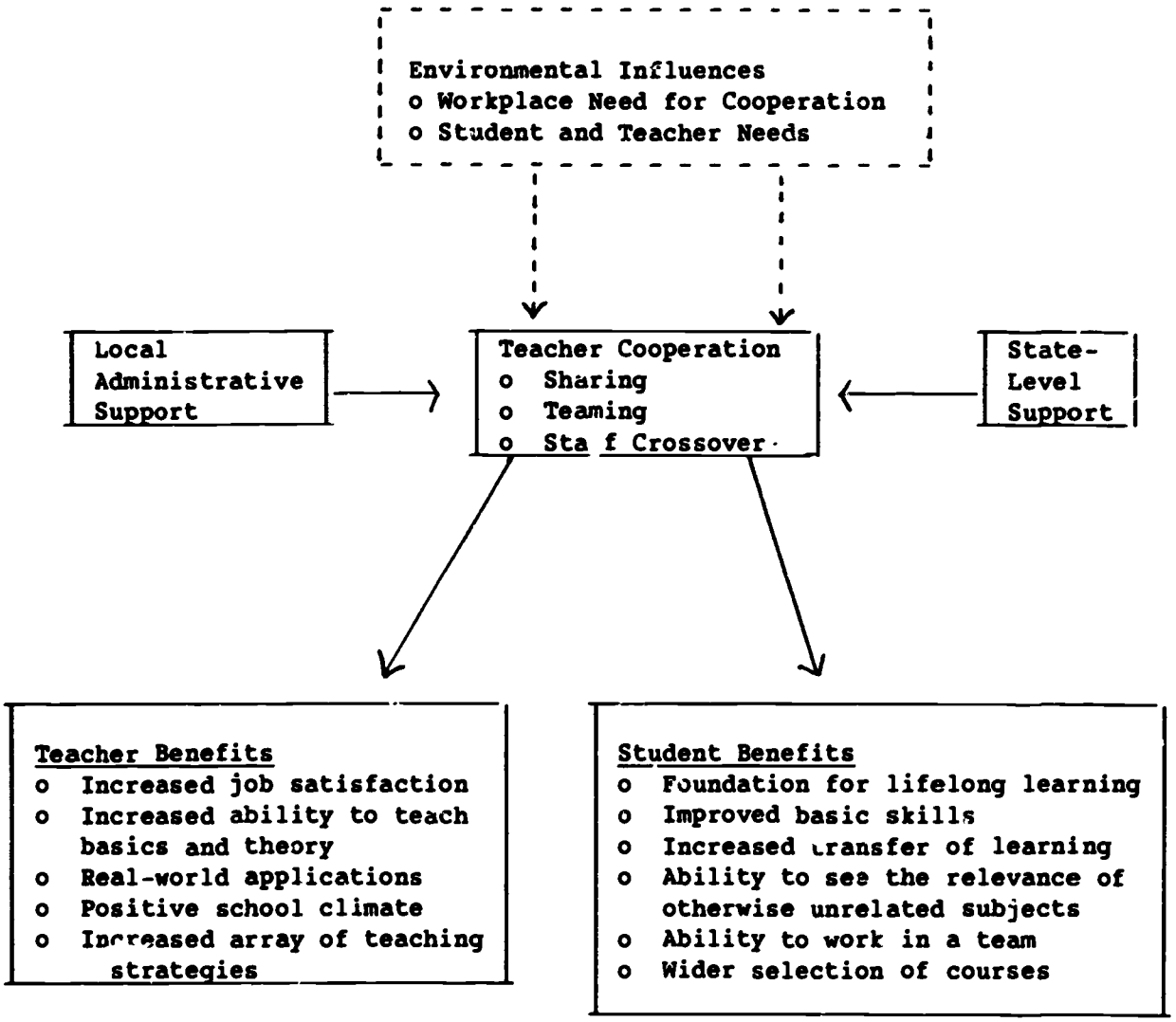
As we have seen, the future workplace requires cooperation rather than competition, skill in acquiring, rather than remembering, new knowledge, and practice in solving problems.

Such workplace skills can be developed today by teachers who are willing to learn them and by administrators who act on the belief that cross-department cooperation is beneficial to teachers and students.

The need for cooperation comes not only from the workplace, but also from the needs of students and teachers. Teacher needs include those for job satisfaction and the rewards of seeing students see relevance in what they are learning. Student needs include the need for applying what they learn and the satisfaction of working with each other.

FIGURE 1

A FRAMEWORK FOR TEACHER COOPERATION



This recognition of the importance of teacher cooperation in order to help students needs to be effectively communicated to teachers. Just as business leaders need to establish and communicate a vision of what is needed and establish priorities and strategies for achieving it (as described by Peters and Waterman in their book In Search of Excellence), so do school administrators (Owens, 1984). Support is also needed at the state level. In many states, however, vocational education staff members seldom see or interact with others in the department of education. As a first step, these staff have to learn about one another and examine how they can work together to support all students. Once this is done, language arts supervisors can provide workshops to vocational and academic teachers explaining how to enhance written skills, regardless of the subject area taught. With local and state support, high school staffs can creatively demonstrate cooperation.

In their publication from the National Center for Research in Vocational Education, Techniques for Joint Effort: The Vocational-Academic Approach, Pritz and Crowe (1986) describe three cooperative models: for sharing, teaming, and staff crossover. In sharing, academic and vocational teachers use the same curriculum plans and resources. In teaming, vocational and academic teachers develop a correlated course of study and share teaching. In staff crossover, teachers exchange roles and may teach each other's classes.

In presenting this framework, we recognize that teacher cooperation is unlikely to be enthusiastically embraced unless teachers are convinced that there are real benefits not only for students but for themselves. Therefore, it is important to note at least four teacher benefits that can be demonstrated. First, vocational teachers learn effective strategies for teaching basic skills and for teaching the theories that lie behind occupational skills. In return, academic teachers learn to help students apply their basic skills to careers that interest them.

Increased cooperation can lead to a general sense that teachers use working as a team to build a positive school climate and attain schoolwide goals. This feeling of teamwork can be fun and generate excitement in teachers who have become bored, frustrated and lonely. Finally, teachers can acquire new teaching techniques, as did one high school math instructor who worked with a drafting teacher to develop computerized applications of math.

All of this discussion about teacher cooperation would be pointless if it failed to have positive benefits for students. A payoff for vocational students should be an improvement in their basic skills applications and in their ability to transfer learning across disciplines. Academic students learn real-world applications of what could otherwise appear to be unrelated subjects. Students in both tracks learn the skills of cooperation, and, where equivalent credit is available, students can choose from a wider selection of courses.

Barriers to Cooperation

Site visits and interviews with academic and vocational teachers in schools where there is a commitment to working cooperatively have revealed a number of actual and potential barriers to teacher cooperation. Many of the same barriers were identified during the Idaho Basic Skills Project summer workshop. They include:

- lack of administrative support
- inadequate time for meetings and exchange of ideas
- feelings of isolation and uninvolvement among some teachers
- unwillingness to step outside of one's own discipline
- negative attitudes and "finger pointing" among some teachers
- increased state graduation requirements involving more academic coursework
- the threat of change
- concern about extra work involved
- perception that cooperation is just another passing fad
- increased costs for staff development and teacher release time
- limited educational backgrounds of some vocational teachers with restricted certificates can create anti-intellectual biases

Principles Enhancing Cooperation

Schools striving for better cooperation also had insights about what is needed to facilitate cooperation:

- adequate time for teachers to plan and work together
- strong administrative support and direction
- teachers' self-confidence
- trust and respect for the other teachers' competencies
- an open environment that encourages experimentation and allows for failures
- teachers' awareness that cooperation is expected
- schoolwide recognition that change is slow and sometimes painful
- the joy of seeing students accrue benefits from teacher cooperation
- contributions from, and appreciation of, the local business community
- personal recognition by administrators and those outside the school

ILLUSTRATIVE PRACTICES

Successful practices for integrating academic and vocational education can be grouped into five categories: 1) those occurring within a single class; 2) between two classes; 3) across a school; 4) beyond the school; and 5) at the state level. Examples are given here for all five levels.

1. In Class

   - In a math class, students are required to measure the same lengths with several measuring tools that are used in home economics. They study units of length, compare the quality of tools involved, learn to double-check their calculations, and master methods for measuring difficult-to-reach areas. Measuring devices include tapes, protractors, and T-squares.

   - Teachers in a Principles of Technology class show videotapes demonstrating how concepts from physics are being used in various occupations.

   - A math teacher uses Ohm's law as an example in the algebra class.

   - A language arts teacher wants students to understand roadblocks to communication. She explains different types of roadblocks such as ordering, threatening, preaching, blaming, psychoanalyzing, and name calling. Each roadblock is put on a note card and students are given one to roleplay, using their personal or work experiences.

   - A home economics teacher asks students to plan and prepare an unexpected meal for someone special in 30 minutes using only groceries on hand. Students must use brainstorming techniques they were taught, and evaluate two or three possible choices.

   - An industrial mechanics class has students learn sequencing to perform a job skill at the same time that they practice written and oral communication. Students select a skill to demonstrate, write out step-by-step instructions, have another student observe them following the directions in proper sequence, recite the directions (checking for grammatical errors), and then give oral directions to a different student to see if that person can perform the skill desired.

2. Between Classes

   - Vocational teachers make up a weekly list of occupational terms that students must learn to use and spell correctly in their English class.

- In electronics class juniors study direct circuits, while in science they analyze electronic motors.

- A business education teacher provides a sample form letter and suggestions for agriculture students who need to write away for free or inexpensive farming materials.

- [illegible]e and vocational education teachers work together to develop and operate an environmental science class in a 40-acre woodland nature preserve. Among other things, students construct salmonoid egg-hatching boxes and establish a migratory fish run in a local stream. Biology and botany classes identify trees and plants, which woodworking and metals classes mark with specially designed plaques.

- Vocational students are tested in math, and those with low scores are tutored twice a week by volunteer students from their particular occupational areas. Each student has a list of skills to be mastered and can proceed at his/her own pace.

3. School Level

- Academic and vocational teachers have set up a schoolwide problem-solving program for students, and a file of problem-solving exercises has been set up for teachers in the staff resource center.

- In a schoolwide oral language project, teachers agree to help students spot and overcome the use of double negatives, incorrect verb tenses, and improper usage.

- Recognizing the need for students to use better study skills, teachers at a junior high school write a one-week curriculum on study skills for use by all teachers in the first week of school.

- Vocational teachers conduct informal classes several evenings for other teachers who want to learn more about a vocational area.

- The Basic Skills team in Idaho distributes problem-solving posters to the rest of the faculty who display them. Charts explaining the elements of good writing are also used.

4. Beyond the School

- Seniors interested in learning the math needed for a technological society receive instruction from their vocational-technical teachers, who invite local tech-college instructors to consult with them and their classes.

- o As one way of gaining first-hand experience in writing, students in a cooperative office education program interview secretaries or general office workers and request sample letters and memos for review.

- o Students enhance basic math skills by preparing a monthly budget to determine how much money they need to make in their entry-level positions. Families support the project by helping students determine costs for utilities, insurance, and other monthly living expenses. Others in the community are asked to provide information about prices.

5. State Level

- o Interagency articulation seminars initiated this year in Idaho bring together key staff from the State Department of Education and the State Division of Vocational Education. This group has planned and initiated a statewide Basic Skills Project in ten districts and is discussing Principles of Technology, Applied Math, and Applied Communications.

- o A one week Linear Measurement Unit, developed by the Basic Skills Project in Idaho, has been distributed to all trade and industry instructors in the state, as well as to all Basic Skills team members in 10 districts. This unit can be taught in math or vocational courses to fill the gap found in students' understanding of measurement.

Four produces have resulted from this NWREL work that could be helpful to educators and policymakers. The first is a literature review on improving secondary vocational education that applies findings from the school effectiveness literature to vocational education. The second is a set of teacher training materials. The third is a Guide for Enhancing Cooperation Between Vocational and Academic Teachers, the fourth is an annotated bibliography on the topic of academic and vocational teacher cooperation.

References

Hall, G., and Loucks, S. (1981). Innovation Configurations: Analyzing the Adaptations of Innovation. Austin, TX: Research and Development Center for Teacher Education, The University of Texas.

Hall, G.E., and Loucks, S. (September, 1978). Teacher concerns as a basis for facilitating and personalizing staff development. Teachers College Record, 80(1), 36-53.

Matarazzo, C. (1986) The Benson Project. Portland Oregon.

National Alliance of Business (February, 1986). Employment Policies: Looking to the Yea. 2000. Washington, D.C.

Owens, T. (December, 1984) A Framework for Improving Excellence in Education. The School Administrator, 41 (11), 11-14.

Owens, T., (1986). Literature Review on Improving Secondary Vocational Education Effectiveness. Portland, Oregon: Northwest Regional Educational Laboratory.

Owens, T., (1987). Pilot Test Report on the Study of Effective Vocational Education. Portland, Oregon. Northwest Regional Educational Laboratory.

Owens, T. (1987). A Guide for Enhancing Cooperation Between Vocational and Academic Teachers. Portland, Oregon: Northwest Regional Educational Laboratory.

Pratt, H., Thurber, J., Hall, G., and Hord, S., (1982). Case Studies of School Improvement: A Concerns Based Approach. Paper presented at the meeting of the International School Improvement Project of OECD/CERI, Palm Beach, Florida.

Pritz, S.G. and Crowe, M.R. (1986). Techniques for Joint Effort: The Vocational-Academic Approach. Columbus, Ohio: The National Center for Research in Vocational Education.

Ratcliff, E. (1987). Administrator's Handbook for Assembling a Basic Skills Team and Starting a Basic Skills Project. Boise, Idaho: Idaho Division of Vocational Education.

APPENDIX A

Annotated Bibliography

Crow, D. A Step-by-Step Guide to Integrating Science Concepts and Vocational Skills in the High School Classroom: The Sandy Union High School Experience. Sandy Union High School District #2, 17100 Bluff Road, Sandy, Oregon 97055, 1986.

In addition to describing Sandy's environmental science program, the guide discusses how to plan a combined program, select teachers, use an oversight advisory committee, and evaluate the effort. Sample planning and survey forms are provided.

Duggan, P., and Mazza, J. Learning to Work--Improving Youth Employability. Washington, D.C.: Northeast-Midwest Institute: The Center for Regional Policy, 1986.

This study includes a good chapter on basic skills and site findings from a Brandeis University study showing that the most important factor in persistent youth unemployment is lack of basic educational skills. It identifies some ways that business leaders can help plan basic skills curricula.

Hoffman, Kirby. "Put an Academic Teacher on Your Advisory Committee." Voc Ed Journal, Vol. 60, No. 5, (August, 1985).

The author, a word processing teacher in ontiac, Michigan, found real benefit when an English teacher was added to his dustry advisory committee and when the nonvocational personnel were given rtant work to perform on the committee.

Incardone, Peter. Teaching Students to Read Better. Professional Development Series No. 6. The American Vocational Association (1410 King Street, Alexandria, VA 22314, 703-683-3111), 1982.

This concise guide for vocational teachers covers issues such as why students have trouble reading, as well as tips in teaching essential technical reading skills, assisting bilingual students, and using other resources on the school staff.

Lotto, Linda S. Building Basic Skills: Results from Vocational Education. Research Development Series No. 237, The National Center for Research in Vocational Education, The Ohio State University, 1983.

This well-done synthesis of the literature on how vocational students compare to "academic track" students provides a good basis for thinking about strategies for improving the basic skills of students in high school vocational courses.

McClure, L. Options for Equivalent Credit in the High School Curriculum: A Guide for Local Decision Making. Olympia, WA: Commission for Vocational Education, 1986.

After defining equivalent credit, the author suggests steps for awarding this credit and addresses nine common questions surrounding the practice.

Norton, R.E., Harrington, L.G., Fitch, C.C., and Kopp, K. Integration of Academic and Vocational-Technical Education: An Administrator's Guide. Athens, GA: American Association for Vocational Instructional Materials, 1987.

This guide was developed by the National Center for Research in Vocational Education as part of a competency-based vocational education administrator module series. It establishes the need for integration of academic and vocational education, describes some integration strategies, and presents 12 examples from various states.

Owens, T., A Guide for Enhancing Cooperation Between Vocational and Academic Teachers. Portland, Oregon: Northwest Regional Educational Laboratory, 1987.

This guide contains a framework for cooperation between vocational and academic teachers; examples of successful cooperative practices within a class, between two classes, across a school, beyond the school, and at the state level; and guidelines that can be used to support cooperation by principals, central office staff, state level staff, employers, and teacher training institutions.

Pritz, S.G., and Corwe, M.R. Techniques for Joint Effort: The Vocational-Academic Approach. Columbus, Ohio: The National Center for Research in Vocational Education, 1986.

This guide describes teaching techniques that vocational and academic teachers can use jointly to improve students' basic skills. It documents evidence establishing the need to link academic skills instruction to applications in vocational tasks if student learning is to be successful. Three options for cooperation are presented: sharing, teaming, and staff crossover.

Ratcliff, E., Administrator's Handbook for Assembling a Basic Skills Team and Starting a Basic Skills Project. Idaho State Department of Education, 1987.

This handbook contains a description and forms administrators can use to set up a statewide program to infuse basic skills throughout the curriculum. The guide is short, clear, and practical.

Suter, Paul. "Teaching a New Kind of Shop Talk." Voc Ed Journal, Vol. 59, No. 5:31, (August, 1984).

This article describes partnership between Suter, a communication skills instructor at Chemeketa Community College in Salem, Oregon, and Bob Dixon, head of the machine/mechanical department on the same campus. The instructors enrolled in each other's classes to get a better idea of how the subject matter interrelates.

Lucille Campbell-Thrane, Building Basic Skills: Models for Implementation. Special Publication Series No. 41, The National Center for Research in Vocational Education, The Ohio State University, 1983.

This report suggests three ways to improve vocational students' basic skills proficiency using integrated (infused in vocational education courses), non-integrated (separate, "tailored" classes), and combination approaches. The author provided a listing of vocational teacher competencies to help students improve their basic skills.

American Vocational Association. Voc Ed Journal Vol. 59, No. 2 (March, 1984).

This issue's theme is "Teaching the Right Stuff: Where It's Happening Today." Six articles by teachers and a former vocational student discuss how academics and vocational programs must be intertwined. Math and science are the dominant themes.

Communication Skills I: Reading Skills, Writing Skills, Using a Newspaper and Communication Skills II: Using the Telephone, Conducting a Meeting, Making a Speech Division of Vocational Education, State Department of Education, Columbus, Ohio.

These two guides are aimed at vocational teachers who choose to help students increase reading, writing, and general communication skills. Examples from vocational settings are used.

Generalizable Mathematics Skills Assessment User Manual and Resource Directory (2 volumes) Illinois State Board of Education, 1984.

These two manuals by the Department of Adult, Vocational and Technical Education are designed to show teachers how to identify and address the common math skills that cut across a number of secondary vocational programs. Color-coded charts quickly identify basic math applications and tasks from various occupational areas. Student skill inventories are provided. The resource directory lists a wide variety of instructional materials and provides publisher addresses.

Oregon Department of Education and Oregon State University, 1985.

Five handbooks designed for vocational educators looking for ways to reinforce basic skills in vocational classrooms. Titles include: Computer Skills, Mathematics, Reading, Speaking/Listening, Writing. Available at $4.50 each title from Oregon Career Development Consortium, Marion Educational Service District, 651 High Street N.E., Suite 4, Salem, Oregon 97301.

Project STAMM and the Georgia Department of Education. Vocational Applied Mathematics--a series of self-study workbooks in traditional vocational fields. Order auto mechanics, auto body, food services, construction, health occupations, metals, electronics, and electromechanics workbooks from Sopris West, Inc., 1120 Delaware, Longmont, CO 80501. Order industrial arts, cosmetology, drafting, and graphic arts workbooks from Ronda Packer, Vocational Education Materials Center, University of Georgia, Green Street, Athens, GA 30602.