DOCUMENT RESUME

ED 335 520 CE 058 738

AUTHOR Haynes, Thomas S.; And Others
TITLE Integrating Academic Content into Business Education: Results from Research in Illinois.
PUB DATE 91
NOTE 28p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Education; *Business Education; Communication (Thought Transfer); *Curriculum Evaluation; *Educational Cooperation; Educational Research; *Integrated Curriculum; Mathematics; Pilot Projects; Program Effectiveness; Program Evaluation; Secondary Education; Student Attitudes; Teacher Attitudes
IDENTIFIERS Applied Communication; Applied Mathematics; *Illinois

ABSTRACT

Illinois State University and University of Illinois faculty collaborated to pilot test and evaluate Applied Academics curricula in Illinois. Three sets of pilot sites included the following: (1) 14 local education agencies that pilot tested Applied Communications and/or Mathematics; (2) 10 sites at which vocational teachers collaborated with academic teachers; and (3) sites at which academic and vocational instructors and administrators identified barriers and incentives to collaboration. Instruments used at the pilot sites for applied curricula collected data on students, teachers, and school districts; information concerning participant expectations and outcomes; and educational background of students and teachers. Teachers at the collaborative sites kept journals of their collaborative interactions with academic teachers. Informal meetings were held with participants in the third set of pilot sites. Teachers found the applied academics materials effective and promoted academic/vocational collaboration; students indicated that the materials had a positive impact on their interest in content. Time constraints and a clear mission were the most important barriers to effective collaboration. On the positive side, teachers acquired assistance, money, contacts, and resources. The project developed a flowchart for strategic planning for curriculum integration and a content outline for a guidebook for integration activities for teachers and administrators. (21 references) (YLB)

Integrating Academic Content into Business Education: Results from Research in Illinois

Thomas S. Haynes
Illinois State University

Dale Law and Jerry Pepple
University of Illinois

Abstract

Faculty at Illinois State University and University of Illinois collaborated to pilot test and evaluate Applied Academics curricula in Illinois. The researchers collected data on the impact of Applied Communications and Applied Mathematics curricula on students and programs. In addition, they assessed, through case studies, procedures, and guidelines that educators can follow to cause academic and vocational education teachers to work cooperatively.

Data revealed several positive aspects of the Applied Academics curricula that would support the use of these materials in business education classes. Data also indicated drawbacks, concerns, and key processes to consider when using these materials, as well as how to facilitate collaboration between academic and vocational teachers.

Introduction

Demands for school reform have been based on the popular view that schools should be held accountable for their failure in teaching students the basics as noted by Bennett and McLaughlin (1988), Harris (1988), Lockhead (1988) and others. In response to this challenge, state and local school boards have initiated a number of reform measures, such as raising teacher certification standards, increasing the number of traditional academic courses for graduation, modifying textbook adoption procedures, and lengthening the school day or school year. These measures are all concerned primarily with educational organization or policy matters.

Clune, White, and Patterson, (1989) perceived from their research of the reform efforts that high school graduation course requirements were the most likely to achieve the general objective of developing a more rigorous academic education. The results of their study found that the math and science courses which were added in response to state high school graduation requirements were mostly at the basic, general or remedial levels. They also concluded that, because of these increased course requirements, the number of vocational courses that were offered declined. However, consistent with the principle of seeking integration of academic and vocational instruction, a more logical and promising approach to reform is to consider the holistic nature and possibilities within secondary schools.

The Carl D. Perkins Vocational Education Act of 1984, and the Carl D. Perkins Vocational and Applied Technology Act of 1990 (in conference committee) have emphasized the need for strengthening the academic foundations of vocational education. These Acts are but one initiative among many representing a movement to bridge the existing gap between academic and vocational programs. Recent literature is rich with suggested approaches to improving the basic skills of individuals as they prepare to enter the work force. Weir (1987), Parkhurst (1986), Barton (1986), Finch and Crunkilton (1985), the National Center on Education and the Economy (1990) have concluded that the modern economy requires a different labor force than is currently being prepared. The new labor force will be required to adapt to varied patterns of work, to take initiative and make decisions, to possibly have a part in running their companies, and to help establish management policies.

An article appearing in the New York Times (1988), noted that, "Concerns of the business community for a skilled work force have never been greater than in the 1980s." The article also pointed out that the problem is twofold. The jobs themselves require greater reading, writing, and mathematical skills, but the process of retraining requires a higher level of these basic skills. Schmidt (1988) concluded from her research on the use of database software documentation manuals that vocational students would have a difficult time using and understanding technical manuals which are used in many of today's occupations. A recent joint publication of the U.S. Department of Education and the U.S. Department of Labor (1988) reports research findings which indicate that the kinds of reading, writing, and analytical tasks that workers routinely perform on the job are different from those which students are taught in schools or in general adult literacy programs. Additionally, U.S. News & World Report (June 16, 1989) stated that in 1965, a car mechanic needed to understand 5,000 pages of service manuals to repair any automobile on the road; today, that same mechanic must be able to synthesize 465,000 pages of technical text. Since the application of basic skills on the job is embedded in real job tasks, education and training programs must move toward using traditional school-based approaches. Further, the report argues that such programs also hold out promise for helping employees and future employees in developing their analytical reasoning abilities, thus enabling them to more readily transfer their experience from one job to another. Resnick (1987) discussed this disconnection between in-school and out-of-school learning during her 1987 AERA Presidential Address when she stated that, "there is growing evidence that not only may schooling not contribute in a direct and obvious way to performance outside school, but also that knowledge acquired outside school is not always used to support in-school learning."

To assure that students can adapt to the ever-changing nature of society and the work place, curriculum revitalization efforts in vocational education must address these needs. It is imperative that secondary and postsecondary vocational programs and services

share in meeting the fundamental responsibilities of public education to (a) assure that all students, whether youth or adult, attain appropriate levels of achievement in areas fundamental to their continuing development; and to (b) assure that all students attain a satisfactory level of achievement appropriate to either immediate employment or advanced education in preparation for later employment.

Model for Integrating Academic and Vocational Education

Barton (1986) and Lotto (1988) in their review of the research on vocational education both determined that vocational education needs to do much more in integrating its curricula with general education. In the past, vocational education has developed its programs in isolation from general education and tended to concentrate on teaching occupational specific tasks. Lotto (1988) concluded from her research that students generally enrolled in vocational education because they liked it and they rated it near the bottom in difficulty. Vocational education was not emphasizing basic academic skills as noted by Lotto:

> Employers are generally positive toward vocational education as a provider of specific occupational skills. They are not well satisfied with the basic skill proficiencies and general trainability of young workers in occupations not requiring a four-year degree. (p. 17)

It was from research and reports similar to these that spurred state agencies and other leaders in vocational education to seek out and develop models to enhance the teaching of basic academic skills (Pritz, 1988; Grubb and Plihal, 1990; Benson, 1989; Owens and Linder, 1989; and Southern Regional Education Board, 1989, 1990). Inherent within each model being pursued by educational agencies to integrate basic academic skills into vocational education is curriculum development or modification.

Since states have the major constitutional responsibility for providing public education in the U.S., curriculum development and innovation are often spearheaded by state departments of education. Interstate curricula consortia have been prominent in vocational education for several years (e.g. Vocational Technical Education Consortium of States, National Network Curriculum Coordination in Vocational and Technical Education). Another such effort is the consortium of 46 state and provincial vocational education agencies which comprise the Agency for Instructional Technology (AIT), a private, non-profit organization in Bloomington, Indiana. AIT was established in 1973 to strengthen education through technology and is governed by a Board of Directors representing American-Canadian education. One other nonprofit public service organization which operates through a consortium of state agencies is the Center for Occupational Research and Development (CORD) located at Waco, Texas. Since its inception, CORD has developed curricula for new and emerging technologies.

During the mid 1980s AIT and CORD pursued the development of applied academic materials for secondary and postsecondary vocational students. Their first notable effort in this area of vocational education was the development of Principles of Technology (PT) curriculum materials. The PT effort was funded by a consortium of 35 states and provincial vocational education agencies contracted jointly with AIT and CORD to develop a set of applied physics curriculum materials. The development of PT began in 1984 with a consortium investment of about three million dollars. PT was completed and available for consortium members to begin implementing in 1986. In general, federal vocational funds were used by the consortium members to purchase these materials. The PT materials were given top ratings for "technical physics" by the American Association for the Advancement of Science in the 1988 March/April issue of Science Books and Film. For a thorough discussion of the development of PT, readers should review the document titled, Design and Assessment of a Formative Evaluation of the Principles of Technology Curriculum Materials, 1986, conducted by the National Center for Research in Vocational Education when it was operated by The Ohio State University.

The genesis of the idea to develop Applied Communications and Applied Mathematics materials by and large resulted from the development and implementation of Principles of Technology. Beginning in April, 1985, discussions by state directors of vocational education with representatives of AIT and CORD clearly indicated that additional curriculum materials in applied communication and mathematics were high priorities. AIT elected to develop a prospectus for a course in applied communication (Agency for Instructional Technology, 1986). CORD committed to develop a one-year set of materials in applied mathematics (Center for Occupational Research and Development, 1989).

Applied Communications is a set of competency-based learning materials designed to help students develop and refine job-related communication skills. The learning materials are divided into 15 instructional modules each of which contains 10 lessons and two video programs. The modules can be used individually or all 15 modules can be used in sequential order as the basis for a year long course. Any of the modules or lessons can also be integrated in vocational education and academic courses where appropriate. The format of each curriculum module consists of a teacher's guide, transparencies, videos, and a student work text. While Applied Communications was developed primarily for high school students, it has been pilot tested in postsecondary and adult programs.

Similarly, CORD developed Applied Mathematics materials. The mathematics content in Applied Mathematics focuses on arithmetic operations, problem-solving techniques, estimation of answers, measurement skills, geometry, data handling, simple statistics, and the use of algebraic formulas to solve problems. The curricula emphasizes the ability to understand and apply functional mathematics to solve problems in work settings. The

material is presented in 25 units with each unit divided into six activity sessions. Applied Mathematics follows the applications approach to learning which is used in the Principles of Technology and Applied Communication materials.

The adoption and use of the AIT and CORD developed materials is currently being referred to as "one model of integration" available to educators as they search for ways to enhance the basic academic skills of their students. This is due, in part, to the broad-based appeal these applied materials have experienced among administrators, vocational teachers, academic teachers, and counselors throughout their developmental stages as reported in their formative evaluation studies. Also, the popularity of this "model" is shown by the fact that three more similar efforts are currently in various stages of development; Applied Biology/Chemistry by CORD, Applied Mathematics II by CORD, and Work place Readiness: Education for Employment, Personal Behavior, Group Effectiveness, and Problem-Solving Skills for a Changing Work place by AIT.

Purpose of Study and Research Questions

Grubb and Plihal (1990) have indicated in their anecdotal research of integration activities across the country, that the concept of integrating academics into vocational education can take many forms and use a variety of strategies. They continue to site the nebulousness of the concept of integration and that there is no single best model. However, one of the more concrete methods of integrating academic with vocational subject matter is through the use of Applied Academic curriculum materials.

With this backdrop, this collaborative research project had the purpose of: (a) pilot testing, Applied Academics curriculum materials to provide an opportunity to collect data to assist in the determination of the effectiveness of this method of integrating academics; (b) to better understand the role of teacher collaboration in integrating academics into vocational subjects, as well as infusing applied learning activities into academic courses; (c) to identify components and processes which are critical to the integration of academic and vocational education; and (d) to identify potential component parts of a proposed teacher/administrator guidebook regarding the integration of academic and vocational education.

From this backdrop the following research objectives were developed:

1. What were the pilot site teachers' perceptions concerning the impact of the Applied Academics materials on student achievement as compared to traditional approaches?

2. How did pilot site teachers use Applied Academics materials in their courses?

3. What were the pilot site teachers' perceptions concerning the advantages and disadvantages of the Applied Academics materials as compared to traditional curricula?

4. What were the pilot site teachers' perceptions of the benefits and disadvantages of collaborative activities?

5. What were the pilot site teachers' insights concerning a broad planning model for integrating academic and vocational subjects, including barriers and key considerations to implementing such a model?

6. What were the pilot site teachers' insights concerning the component parts of a teacher/administrator guidebook on integrating academics?

Nature of Research Endeavor and Methodology

This research effort was accomplished through a collaborative and symbiotic relationship between the Applied Academics project at Illinois State University funded by the Illinois State Board of Education Department of Adult, Vocational, and Technical Education, and the Applied Basics Curricula in Vocational Education: Validation of Student and Program Outcomes project at the University of Illinois, funded by the National Center for Research in Vocational Education. Project staff from both projects met periodically to plan, organize, direct, and evaluate project objectives and activities. Project staff at Illinois State University coordinated three different sets of pilot sites, delivered inservice training, and directed workshops. Project staff at the University of Illinois were most directly involved with the designing of survey and assessment instruments to collect data.

One set of pilot sites included fourteen different local education agencies from across Illinois which pilot tested Applied Communications, and/or Applied Mathematics curricula. These pilot sites were scattered from around the state of Illinois including rural, small town, and urban areas, and ranging from small high schools to comprehensive high schools to area vocational centers. Academic and Vocational teachers participated.

The second set of pilot sites were organized from across Illinois and included vocational education teachers across all vocational areas. The vocational teachers involved from this second set of pilot sites had the assignment of keeping a journal of their efforts to collaborate with academic teachers to strengthen either the academic content of their vocational courses or to improve the applied nature of the academic teachers' courses. These instructors were prepared for this activity through a workshop in September, 1989 and were reconvened at additional dates to review their activities, and journal entries. Finally, this group of instructors prepared a collaborative presentation

for the Illinois Vocational Association Annual Conference in February of 1990.

A third set of pilot site teachers were utilized to identify the barriers and incentives for teachers to be involved with collaborative activities. These teachers entered into collaborative activities and kept journals. These instructors also reviewed a potential strategic planning model for use in planning integration activities and the potential content of a teacher/administrator integration guidebook. These pilot site teachers were from the McLean-DeWitt Regional Vocational System and included academic and vocational instructors and administrators.

Pilot Sites for Applied Curricula

Three meetings were held between the staff of the two projects to work out the details and make the pilot test site selections. Fourteen different local agencies were involved in the Illinois pilot testing of Applied Communications and/or Applied Mathematics. One of the sites is a postsecondary institution, one is an area vocational center, one is a magnet high school, the remaining are comprehensive high schools.

During July and August, 1989, the pilot site administrators were contacted and site visits were made to each institution to orient and inservice all the professional staff who would be involved in the teaching of these materials in the vocational and/or academic program areas. Applied Communication and Applied Mathematics materials were disseminated to the participants and information was secured on the classes where the materials would be used. The participants were given an overview of the projects' expectations. Visitation schedules were discussed and arrangements were made to hold two inservice/evaluation workshops during the academic school year.

Through a review of the related literature and contacts with other researchers involved in applied academics evaluation, sample evaluation survey forms were prepared and printed. To promote cooperation and coordination of data, contacts were made with: Norton Grubb and Jane Plihal, National Center for Research in Vocational Education, Berkeley, California; Thomas Owens, Northwest Regional Educational Laboratory, Portland, Oregon; Gene Bottoms, Southern Regional Educational Board; and David Payne, Educational Research Laboratory, Athens, Georgia.

Sample survey forms from these and other projects and activities were reviewed for data items and procedures. The project staff, in turn, designed survey/data collection instruments which were pilot tested.

The instruments developed to collect demographic data on students, teachers, and school districts; information concerning

participant expectations and outcomes; educational background of students, teachers and administrators are as follows:

1. Administrator Questionnaire Survey Form
2. Teacher Questionnaire Survey Form
3. Student Questionnaire Survey Form

These questionnaires were to be disseminated and completed sometime between December, 1989, and February, 1990. The teacher questionnaire data were collected at the Applied Academics Workshop, December 11, 1989, at Illinois State University in Normal, Illinois. Data were collected from 25 teachers at the workshop. The student questionnaire booklets were disseminated to the participants at the December Workshop and were to be completed by February, 1990. These forms were collected by the project staff during the on-site visitations.

Vocational Education Teacher Collaborative Pilot Sites

Project staff with the assistance of the management staff of the Illinois State Board of Education Department of Adult, Vocational, and Technical Education selected ten vocational instructors to seek out and collaborate with academic teachers to improve the academic content of their vocational courses and to, if possible, improve the applied learning strategies in the academic teachers' courses.

These teachers were identified and solicited during August and September, 1989. They attended an inservice workshop on integration in Champaign, Illinois on September 23, 1989 with instructions to keep a journal of their collaborative interactions with academic teachers. They reconvened in November, 1989 and January, 1990 to discuss preliminary findings and to frame a collaborative presentation to be delivered at the Illinois Vocational Association Annual Conference in Itasca, Illinois. Results from their activities provided insight into benefits and barriers from collaborative integration efforts.

Academic and Vocational Teacher Pilot Sites

Through an initiative by project staff and the regional system director for the McLean-DeWitt Regional Vocational System, volunteer academic and vocational instructors in the region were identified and contacted in August and September, 1989 for their participation to collaborate with other teachers and to keep journal accounts of their activities.

Project staff met once a month with each of the teachers/administrators to discuss collaborative activities related to teaching methods, curriculum content, course development, and incentives and barriers to collaborative activities. These informal contacts between project staff and pilot site teachers continued through May, 1990. On June 4, 1990 pilot site teachers attended a summit meeting at Illinois State University to synthesize their reaction to their activities

throughout the year to review potential strategic planning models for integration, and analyze the components of a proposed teacher/administrator guidebook for curriculum integration.

Findings and Conclusions

Applied Curricula Pilot Sites

This report contains information from the teachers implementing Applied Academics curriculum, including both vocational and academic teachers. The following paragraphs and Tables 1 through 7 are intended to present a brief summary of the type of data collected. A more in-depth analysis is currently under way and includes a cross-correlation between teacher responses and their background data and between student responses and their demographic data. It should be noted that the totals may not add to 100% due to those who did not respond to specific items.

Table 1 and 2 describe the characteristics of the teachers participating in the pilot program to implement the Applied Academic materials. The data indicates, that the sample is an experienced group of teachers in high schools located in diverse communities and various types of school organizational structures. Based on the teacher's responses, it has been estimated that 726 students were enrolled in the Applied Academics courses. These students were spread across grades nine through twelve, with an average of 16 students per class. Some of the teachers participating in the program were teaching the Applied Academics materials in more than one class at the time. As Table 3 indicates, half of the students have been described by their instructors as "average students" and a majority of the students (64%) reported to have enjoyed the Applied Academics instructional approach.

Table 1

Instructor Demographics

Educational Background		Professional Certificate	
Associate degree	4%	Provisional	4%
Bachelor's degree	21%	Annual	16%
Master's degree	50%	Continuing	64%
Associate & Bachelor's	4%	None	4%
Associate & Master's	13%		
Master's and Specialist	8%		
Years Teaching		**Type of Community**	
Two to five years	16%	Rural	32%
Six to ten years	12%	Small town	44%
Eleven to twenty years	52%	Suburban	4%
More than twenty years	20%	Urban	16%
Type of School		**Staff Development Programs Attended**	
Comprehensive high school	64%	State, Regional, and Local	60%
Area Vocational School	12%	All of the above and National	8%
Vocational wing of a comprehensive H.S.	4%	Other	16%
Other (correctional inst., magnet school)	20%		

Table 2

Instructor Demographics

Member of a Professional or Teacher Organization		Frequency of Reading Journals Reporting Current Research	
Yes	72%	Occasionally	56%
No	28%	Frequently	28%

Experience with an Occupation Other than Teaching		Taught Mathematics Classes	
Yes	76%	Yes	44%
No	20%	No	56%

Taught English, Communications or Language Arts Classes		Taught Science Classes	
Yes	24%	Yes	24%
No	76%	No	76%

Taught Vocational Education or Training Classes		Experience Teaching Vocational Classes	
Yes	76%	1 - 5 years	26%
No	24%	6 - 10 years	5%
		11 - 20 years	38%
		20 years or more	26%

Table 3

Student Demographics

Total Number of Students = 726
Students/Class Average = 16

Grade Level		Ability Level of Students	
9th Grade	10%	Gifted	3%
10th Grade	26%	Above average	11%
11th Grade	26%	Average	50%
12th Grade	33%	Below Average	26%
Other (post-secondary, correctional center)	5%	Marginally learning disadvantaged	10%

Did your students seem to enjoy the Applied Materials used?		Sex	
Yes, a lot	24%	Male	59%
Yes, somewhat	64%	Female	41%
No, not too much	4%		
No, not at all	4%		

How many students are in each of the classes in which you are using the Applied Basics Materials?

5 - 10 students per class	16%
11 - 15 students per class	24%
16 - 20 students per class	28%
21 - 30 students per class	28%

The data in Table 4 addresses research question 1. Almost all the teachers (92%) agreed that the Applied Academics materials reflect an increased emphasis on applied learning, while helping the students improve their academic achievement. Four out of five teachers agreed that the Applied Academics materials are effective because they help students understand the subject matter.

Table 4

Selected Items that Address Research Question 1

Do you feel that the Applied Academics materials help students improve their academic achievement?		Do you feel that the Applied Academics materials reflect an increased emphasis on applied learning?	
A great deal	16%	Yes	92%
A fair amount	68%	No	0%
Not too much	4%		

How was the overall impact in terms of instructional effectiveness when using the Applied Academics materials?		Do you feel that the Applied Academics materials are effective because they help students understand the subject matter?	
Excellent	8%	A great deal	36%
Good	68%	A fair amount	52%
Acceptable	16%	Not too much	0%

Answers to research question 2 are highlighted in Table 5. The majority of teachers (64%) indicated that the material was being implemented in a vocational program, and nearly half (44%) indicated that this was their first time using the Applied Academics approach in their courses.

Table 5

Selected Items that Address Research Questions 2 & 5

Prior to this year, how extensively have you used an Applied Academics approach in your courses?		In what type of program are you implementing the Applied Academics materials?	
Often	36%	Vocational	64%
Seldom	20%	Mathematics	28%
Never	44%	Language Arts/ Communication	8%

In what type of course are you currently using the Applied Academics materials?		Were the Applied Academics materials the primary materials used in an existing course?	
A new course	16%	Yes	14%
An existing course	76%	No	86%
Both new and existing	8%		

The data in Table 6 provides some insight into research question 3. Two aspects of Table 6 are particularly interesting. First, the majority of teachers (80%) indicated that the Applied Academics materials have promoted academic/vocational collaboration, with 56% of respondents in favor of academic/vocational team teaching of the courses. Second, nearly half the teachers (44%) indicated that the Applied Academics materials have induced them to incorporate some new techniques into their teaching.

Table 6

Selected Items that Address Research Questions 3 & 6

Based on your experience, what kind of teachers do you think should teach the Applied Academics course?	
Academic teachers	8%
Vocational teachers	24%
Academic/vocational team teaching	56%

Have the Applied Academics had a positive effect on your classroom performance?	
Strongly agree	20%
Agree	60%
Disagree	12%
Strongly disagree	0%

Based on your experience with the Applied Academics materials, would you recommend it to other teachers?	
I would highly recommend it	40%
I would recommend it	36%
Not sure	24%

Do you feel that the Applied Academics materials promote academic/vocational collaboration?	
Yes	80%
No	12%

How was the overall impact in terms of manageability when using the Applied Academics materials?	
Excellent	16%
Good	44%
Acceptable	28%
Poor	4%

Have the Applied Academics materials caused you to incorporate some new techniques into your teaching?	
Strongly agree	36%
Agree	44%
Disagree	12%
Strongly disagree	0%

How well do the Applied Academics materials meet their intended objective* compared to other approaches you have tried before?	
Academic teachers	8%
Vocational teachers	24%
Academic/vocational team teaching	56%

*i.e. stimulate critical thinking and develop problem-solving skills

Table 7 addresses the students' interest in the course and their perceptions of the emphasis placed on basic academic skills. Students indicated that their was an increased emphasis on academic skills because of the use of the materials. Also, the students strongly (68%) indicated that the materials had a positive impact on their interest in the content. In addition, more than half the students (56%) completing this course received academic credit.

Table 7

Students Interest and Type of Credit Received

How was the overall impact in terms of student interest when using the Applied Academics materials?		Do you feel that the Applied Academics materials reflect an an increased emphasis on higher academic expectations for Vocational students?	
Excellent	12%	Yes	80%
Good	56%	No	12%
Acceptable	16%		
Poor	8%		

Did the students completing this course receive vocational credit or academic credit?	
vocational credit	36%
academic credit	56%

Data included in Table 8 were obtained from meetings with Applied Academics materials pilot site teachers. Interestingly, teachers collectively spoke of the common advantages and disadvantages of using the Applied Academics curricula, addressing research question 3, but they also voiced differences of opinion based almost exclusively on specific characteristics or needs of their instructional setting and students.

Table 8

Teacher Perceptions of the Advantages and Disadvantages of Utilizing Applied Communications and Applied Mathematics Materials

1. The materials worked well when adapted to existing courses.
2. They provided an excellent connection between work and school.
3. Teachers needed extra planning time to implement the materials.
4. Applied Communications had several disadvantages as a stand-alone course, while Applied Mathematics didn't.
5. Video programs stimulated excellent discussion activities.
6. Many related activities needed modification to fit local needs.
7. Materials could not be utilized "as is", they needed to be adapted.
8. There needed to be coordinated effort locally so students did not repeat modules in different classes.
9. The materials worked well with cooperative education classes.
10. The materials needed more work scenes and exercises.
11. Teachers saw an improvement in students' math scores.
12. The reading level of some materials was a concern.
13. The materials facilitated academic-vocational collaboration.

Second and Third Pilot Site Teachers' Findings

Data included in Table 9 addressed research question No. 4. Pilot site instructors from pilot sites two and three indicated that time constraints and a clear mission were the two most important barriers to effective collaboration between academic and vocational teachers. Two other major concerns for these teachers were the turf battles between departments and disciplines, and dealing with local bureaucracy related to standards for admission into higher education and teacher certification.

On the positive side, these pilot site teachers indicated quite clearly that through collaboration with professionals across disciplines, they acquired assistance, money, contacts with other individuals, and resources which helped them with their instructional programs. They also indicated that this helped them develop professionally and develop students' interests, achievement, concept of what lies outside of the school, and the need for academic preparation, as well as vocational skills.

Table 9

Summit Report

The barriers that impede collaboration and integration that the teachers identified were:

* local bureaucracy in relation to certification
* state initiatives
* teacher certification
* admission into higher education
* scheduling students and teachers
* competition between departments and disciplines
* time to plan, meet, and work
* the stigma attached to vocational education
* communication problems
* dollar support for new programs
* the risks/rewards for attempting new initiatives
* personal philosophies
* culture
* parents lack of understanding and involvement
* assessment
* clear mission and direction

The top five barriers identified, in rank order were:

1. time to plan, meet, and work
2. clear mission and direction
3. competition between departments and disciplines
4. local bureaucracy in relation to certification
5. admission into higher education

Incentives that facilitate collaboration and integration that the teachers identified were:

* survival
* adding new life to old programs
* the urgency for improvement in education
* the support of democratic education principles
* professional development opportunities and recognition
* self fulfillment
* being a part of an innovative, winning group
* developing a diversity of students in all classes
* acquiring assistance, i.e. dollar support, technical assistance, and resources
* developing students' interests, achievement, and relevant learning

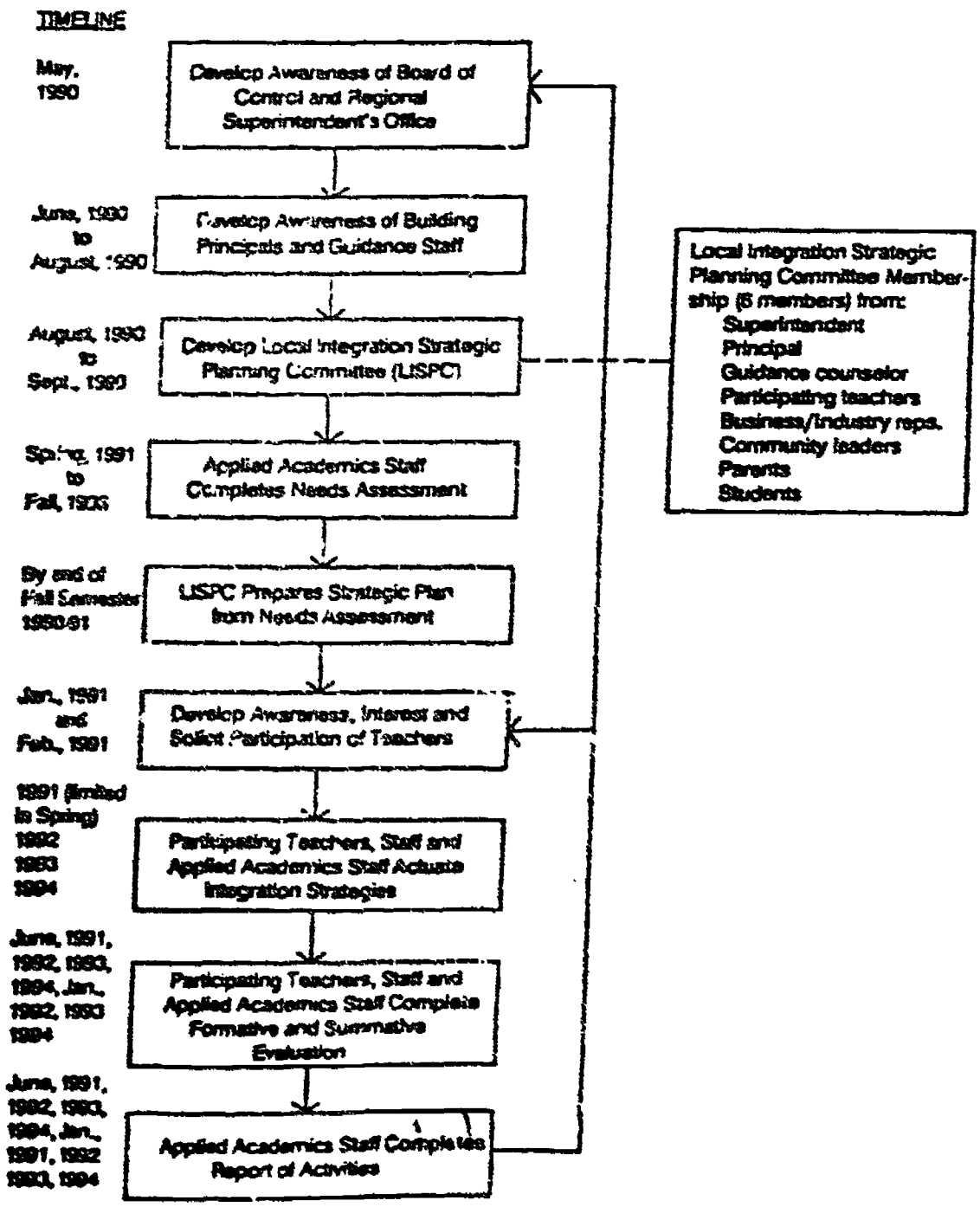
The top five incentives, in rank order were:

1. acquiring assistance, i.e. dollar support, technical assistance, and resources
2. developing students' interests, achievement, and relevant learning
3. professional development opportunities
4. professional recognition
5. survival

Table 10, is a flow chart for strategic planning for curriculum integration which was developed with the assistance of pilot site teachers and administrators in the third pilot site. The basis behind this model is that local professional educators need to assess the needs of the local school setting, students, instructors, and employers to determine areas of most critical need before identifying strategies to integrate academics into vocational education. This model also takes a long range perspective on integration.

Table 10

Instructional Strategies for Curriculum Integration
Pilot Site Integration Process



The outline in Table 11 lists the component parts of a guidebook for integration activities for teachers and administrators. Pilot site teachers and administrators indicated that the guidebook should have a clear description of the mission and provide a strong rationale statement. The guidebook should illustrate how teachers can benefit from integration activities, deal with pragmatic and practical problems associated with integration efforts, and provide sample lessons that illustrate for administrators and teachers the ways to implement integration. The guidebook should also provide a list of resource materials, methods and assistance in lesson planning, suggested scope and sequence fc various courses, a brief national scope statement concerning integration, a list of resource people in the region and state who are already involved in projects, and a resource listing of curriculum materials and equipment. Additionally, the document should identify the concept of flexibility and local needs assessment in determining integration activities, as well as, suggest program timelines, and provide sample instruments for assessing the impact of integration.

Table 11

Integration Guidebook: Preparing Youth for a Productive 21st Century

Enhancing academic content in vocational classes and infusing applied learning in academic classes to improve students' basic skills.

Content Outline

I. Rationale and backdrop.

   A. Reports on education
   B. Reports on trends in the work setting
   C. Recommendations towards a more effective school system to contribute to a more effective economy.

II. Strategies for integrating academics with vocational education to improve students' basic skills.

III. Barriers and incentives to integrating vocational with academic education.

IV. Support and marketing needed to integrate vocational with academic education.

V. Processes and resources for local integration activities.

   A. Listing of key individuals.
   B. Flow chart of contacts and activities.
   C. Check list of participants or constituents involved.
   D. Strategic planning processes and materials.
   E. Curriculum adaptation or development module.
   F. Resources
      1. Technical assistance personnel
      2. Curriculum materials
         a. vocational education
         b. academic
         c. business and industry trade materials

VI. Assessing the impact of integration.

Conclusions

1. In general, teacher and student attitudes toward Applied Academics materials were positive. A majority of the students indicated that they thought the materials were important for them to understand, and most indicated that they found the materials interesting. Students indicated to their teachers that their favorite parts of the Applied Academics materials were the video programs and the simulations (Research question 1).

2. The majority of the instructors reacted positively to the Applied Academics materials and over three-fourths (76%) of the respondents indicated that they would recommend the use of these materials to other teachers. Instructors considered the content of Applied Academic materials to be important for students to understand (Research question 1).

3. Teachers' major suggestions pointed to an increased effort at implementing the materials so that: (a) students enrolled in stand alone Applied Academics courses receive academic credit, and (b) that more academic and vocational teachers have the opportunity to team teach (Research questions 2 and 3).

4. It is apparent that although local settings differ, these Applied Academics materials can be adapted and utilized and are seen as effective in infusing academic content in the vocational classes (Research questions 1 and 2).

5. In regards to the collaboration between academic and vocational teachers, the concern for adequate planning time and local bureaucratic support are key barriers to integration. The responses from the teachers indicated that the barriers to their collaborating with teachers outside their discipline were extrinsic and many times out of their control, such as, the attitudes between disciplines, admission to higher education, the local bureaucracy, and the limits on their time. On the other hand, the incentives which they identified illustrate the motivational nature and professional renewing which takes place because of collaborative activities (Research questions 3 and 4).

6. Concerning the strategic planning flow chart, pilot site teachers and administrators supported the notion of planning activities to meet needs, but there has to be a clear concise statement of mission and goals (Research question 5).

7. In dealing with local educational environments, the strategic planning committee should be made up of a broad cross-section of participants to provide input and to disseminate information to constituent groups (Research question 5).

8. Finally, in regards to content of a proposed guidebook, pilot site teachers and administrators indicated a strong need for such a document. They felt that it should be concise, in

order that administrators and teachers could utilized easily to proceed with individual school and instructor integration activities (Research question 6).

Recommendations for Business Educators

Based on the preliminary findings of this study, the following recommendations can be elicited.

1. Business educators have state and nationally produced curriculum materials which have activities which focus on the enhancement of basic skills. The integrating of these in business education courses should become a renewed emphasis of business educators.

2. Applied Academics curriculum materials do offer systems and content to enhance and reinforce academic skills in business education courses. Business educators should support the infusion of these where appropriate.

3. Business educators should make the effort to collaborate with academic teachers to effectively plan instruction to integrate academic content or to develop applied academic courses to improve students' basic skills.

4. Business educators should increase their involvement in integration activities, i.e. collaboration, team-teaching, teacher sharing. This builds respect and provides a tremendous opportunity for informing and marketing business education programs with in-school publics and out-of-school publics.

5. Business educators should develop and test strategies and evaluation methods for integration efforts.

6. Business educators should utilize lead business educators, such as state supervisors for business education, state business education association leadership, and business teacher educators to pursue the implementation of integration strategies in their states which prove to be effective in raising the basic skills of business education students.

7. Business teacher educators and state business education supervisors should take a leadership role in assisting local education agencies in developing integration activities which are based on strategic planning to meet the needs of the local education agency.

8. Business educators in leadership positions should utilize planning processes and resource materials to meet local needs in the pursuit of raising students' basic skills abilities.

9. The Policy Commission for Business Education should develop a strong, supportive position statement regarding the

enhancement and reinforcement of basic academic skills in business education courses to provide a philosophical base from which to focus business educators' activities.

10. NBEA and its affiliates, Delta Pi Epsilon chapters and NABTE institutions should make integration a priority activity over the next three to five years and provide leadership in developing and delivering teacher pre-service and in-service training so the teachers have the pedagogical skills and materials to effectively infuse integration activities.

References

Agency for Instructional Technology. (1986, June). Prospectus: Applied Communication, a curriculum and learning materials for high school students. Bloomington, IN.

Barton, P. E. (1986, Winter). Employers and high schools: he fit between learning and working. Peabody Journal of Education. 63(2), 103-149.

Bennett, W. J., & McLaughlin, A. (1983). The bottom line: basic skills in the workplace. A Joint Publication of the U. S. Department of Labor and the U. S. Department of Education. Washington, DC.

Benson, C. (1989, July 27). On integrating academic and vocational education. Testimony before the Senate Subcommittee on Education, Arts, and Humanities. Washington, DC.

Center for Occupational Research and Development. (1989, June). Prospectus: Applied mathematics II, to design and develop eleven additional units to augment the twenty-five units of applied mathematics that have recently been completed. Waco, TX.

Clune, W. H., White, P., & Patterson, J. (1989, February). The implementation and effects of high school graduation requirements: First steps toward curricular reform. (Research Report Series RR-011). Center for Policy Research in Education, Rutgers, The State University of New Jersey, New Brunswick, NJ.

Finch, C. R., & Crunkilton, J. R., (1985, March). Is your curriculum for the nineties?. VocEd Journal. 60(2), 31-32.

Grubb, W., & Plihal, J. (1990). Preliminary report: The cunning hand, the cultured mind: models for integrating vocational and academic education. Berkeley, CA: National Center for Research in Vocational Education.

Harris, L. (1988, Spring). The American workforce: restoring its competitiveness. Phi Kappa Phi Journal, 38-39.

Lockhead, C. (1988, May 23). Even the most basic jobs now require basic skills. Insight, 30-40.

Lotto, L. S. (1988). What about vocational education: A review of the evidence. Educational Policy. 2(3), 265-285.

National Center for Research in Vocational Education. (1986). A design and assessment of a formative evaluation of the principles of technology curriculum materials. Supported by the Office of Vocational and Adult Education, U.S. Dept. of Education. The Ohio State University, Columbus, OH.

National Center on Education and the Economy. (1990). America's Choice: high skills or low wages! Rochester, NY: author.

New York Times. (1988, May 8). Firms learning more workers need retraining in basic skills. The Champaign - Urbana News-Gazette, C-7.

Owens, T., & Linder, F. (1989, February). Entry-level worker study: Phase I report, executive summary. Northwest Regional Educational Laboratory, Portland, OR.

Parkhurst, C. C. (1986, September). Why we must stress academic skills. Vocational Education Journal. 61(6), 11.

Pritz, S. G. (1988, March). Basic skills: the new imperative. Vocational Education Journal. 63(2), 24-26.

Resnick, L. B. (1987, December). The 1987 AERA Presidential Address: Learning in school and out. Educational Researcher. 16(9), 13-20.

Schmidt, B. J. (1988, Spring). Reading skills students need for use of technical materials. Journal of Vocational and Technical Education. 4(2), 14-20.

U. S. News & World Report. (1989, June, 26). The forgotten half. 106(25), 44-49, 53.

Weir, D. (1987, Fall). Vocational education in the 1990's - more or less. Journal of Vocational and Technical Education. 4(1), 39-47.