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ABSTRACT

Fifty-three secondary educators in six Alaskan school districts participated in a Carl Perkins grant project to integrate academic and vocational education and thinking skills. The first year of the project combined onsite and distance delivered instruction on the development of interdisciplinary units and integration models. An electronic college linked project teachers and National Center for Research in Vocational Education researchers via Bitnet. During Fiscal Year 1993, project teachers were to field test 21 4-week interdisciplinary units developed by teams of academic and vocational educators in vocational classrooms and participate in a one-graduate-credit course taught via LiveNet (one-way video, two-way audio). (A concept outline that guided the educators in development of the interdisciplinary units is appended.) (YLB)

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Integrating Academic and Vocational Education and Higher Order Thinking Skills: An Alaskan Model

Description:

Fifty-two secondary educators in six Alaskan school districts are participating in a Carl Perkins grant to integrate academic and vocational education and thinking skills. The first year of the project combined on-site and distance delivered instruction on the development of interdisciplinary units and integration models. An electronic college was initiated which linked project teachers and National Center for Research in Vocational Education researchers via BitNet. During FY 93, project teachers will field-test 21 four week interdisciplinary units in vocational classrooms and participate in a 1 graduate credit course taught via LiveNet (one way video; two way audio).

Key points:

1. Project demonstrates postsecondary/secondary collaboration on the delivery of on-site and distance-delivered staff development to teachers in bush Alaska and urban communities.

2. Distance-delivered technologies included audio-conferencing; computer mediated communication and LiveNet.

3. Project included an electronic college which allowed teachers to interact with each other and with NCRVE researchers. Participants were surveyed regarding their perceptions of the effectiveness of computer-mediated communication as a staff development strategy.

4. Basic integration model initiated by the project teachers was the development of 4 week interdisciplinary units developed by teams of academic and vocational educators. Units are being field tested in vocational classrooms this year.

5. Project schools were encouraged to adapt other integration models appropriate for their students' needs. The Senior Project model of Integration was initiated at Sitka High School and investigated by several other project schools.

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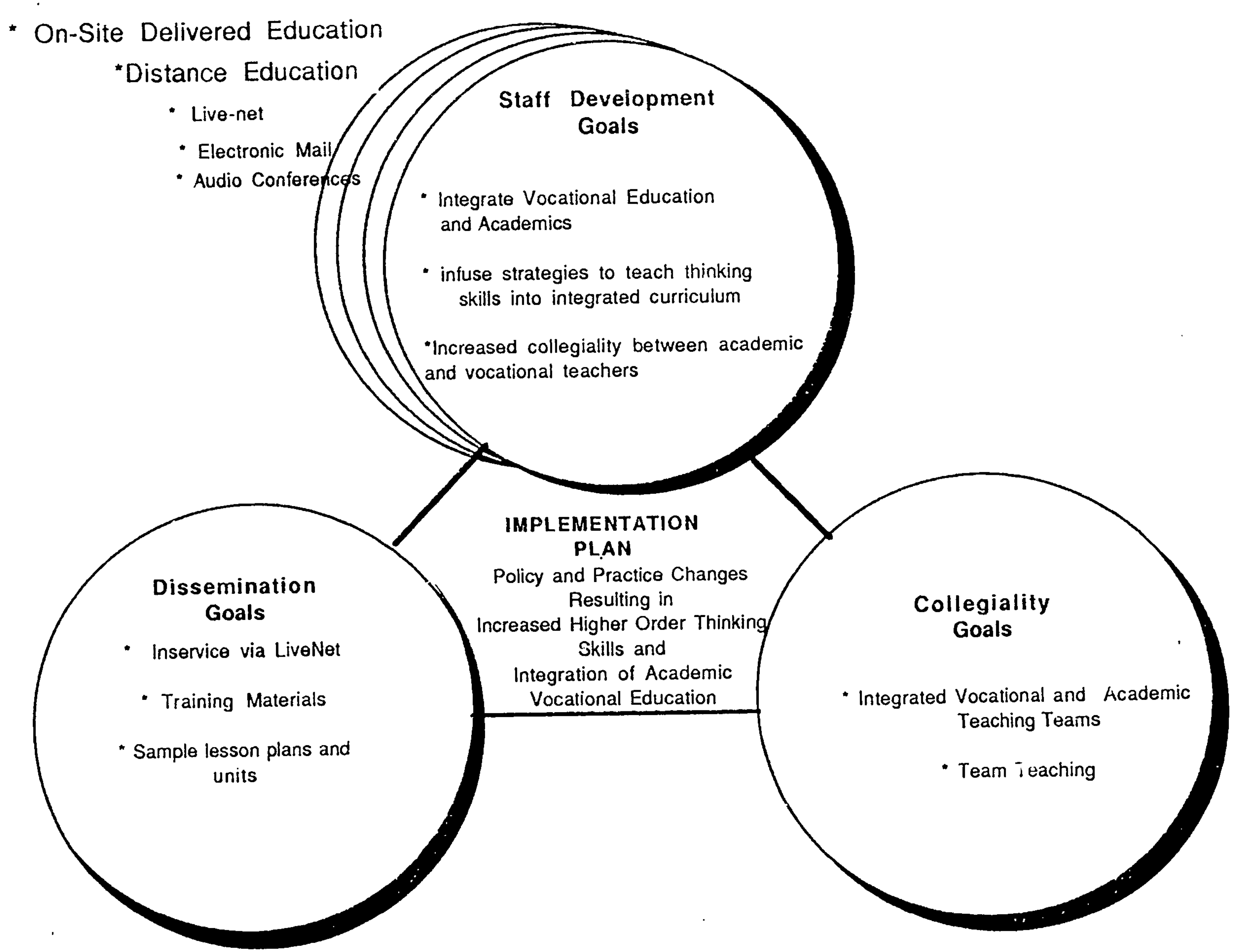
* On-Site Delivered Education
*Distance Education
* Live-net
* Electronic Mail
* Audio Conferences
Staff Development Goals
* Integrate Vocational Education and Academics
* infuse strategies to teach thinking skills into integrated curriculum
*Increased collegiality between academic and vocational teachers
IMPLEMENTATION PLAN
Policy and Practice Changes Resulting in Increased Higher Order Thinking Skills and Integration of Academic Vocational Education
Dissemination Goals
* Inservice via LiveNet
* Training Materials
* Sample lesson plans and units
Collegiality Goals
* Integrated Vocational and Academic Teaching Teams
* Team Teaching

INTEGRATION IN ALASKA: UP AND RUNNING

A teacher recently commented that trying to accomplish school reform was like "changing the pistons on an engine while it was still running." This analogy is a fairly accurate description of this two year Alaskan project designed to integrate academic and vocational education and higher order thinking skills. The challenge has been to motivate high school teachers to change at the same time they are teaching.

The project involves 53 secondary educators in six school districts spread from the southeast panhandle of Alaska to the north bordering Yukon Territory. Participating districts were chosen on the basis of having the highest concentration of special needs students in their vocational programs and the interest shown by their teachers and administrators in the project. The project operates on an annual budget of $30,000.

Problems of distance and conservative funding have been resolved through a variety of staff development strategies. These strategies included a combination of on-site and distance delivered instruction. During the Spring of 1991, a graduate level course was scheduled and delivered on -site in each of the districts at their convenience. On-site education was enriched by distance delivered instruction which included communicating with teacher educators and researchers from the National Center for Research in Vocational Education. Each of the Alaska project teachers received a user identification and training which linked them via computer with NCRVE educators and other project teachers through BitNet and the University of Alaska Anchorage electronic mail system. This Alaskan project served as a prototype for the National Center for Research in Vocational Education which linked teachers who attended NCRVE 1992 summer institutes through electronic mail and bulletin boards on ADVOCNET throughout the United States.

The use of this technology and perceived effectiveness of these linkages by the project teachers was assessed by Donna Bartman, UAA Master's degree candidate in Vocational Teacher Education. After surveying project teachers she found that by using electronic mail they felt less isolated as a teacher and used the technology to share curriculum ideas and resources. However, she also found that the teachers communicated mostly with other Alaskan teachers and had little communication with NCRVE researchers and teacher-educators. This could be partially attributed to

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timing as teachers did not get online until late in the second semester.

Academic and vocational teachers were teamed during on-site training and developed an interdisciplinary four-six week unit demonstrating the integration of academic and vocational education and thinking skills. The resulting 21 units were being field tested in vocational classrooms this school year. This last fall, at Wasilla High School, a guidance counselor teamed with an Applied Communications teacher to work with students on an employability skills unit. These students are checking off their newly acquired skills as part of their educational "warranty" from the Matanuska Susitna School District. At Sitka High School, a marine science teacher and computer applications instructor jointly developed four weeks of minc stretching activities which led the students stream-side to a local creek to collect data. The students learned a variety of computer applications as their field notes were entered into the computer to help them determine if Wrinkleneck Creek could support Coho salmon fry. These students concluded their studies this spring by making a formal presentation to Alaska Fish and Game officials. At Delta High School a partnership was formed with Conaco, the Principles of Technology students and Computer Application students to develop a series of hypercard stacks for the purposes of individualizing the units included in the first year of Principles of Technology.

Forty-one teachers were linked this fall via LiveNet (one way video and two way audio). Six two and a half-hour seminars featuring nationally recognized experts and project teachers were transmitted from the University of Alaska Anchorage campus and received by satellite dish in each of the districts. The programs included further discussion of how to implement and teach thinking skills in context; the development of an interdisciplinary curriculum; observing the implementation of the Senior Project model of integration at Sitka High School and the role of integration within outcome based education in the Matanuska-Susitna Borough School District and the Dimond High's STAMP program, a school-within-a school model of integration integrating math, science and technology program around the theme of Natural Resources.

Although it is still too early to completely judge the effectiveness of this staff development model, we think we may have figured out how we can get more mileage out of the system while the engine is still running. An assessment survey of services delivered during the first year of this grant was mailed to all project teachers with the teachers indicating that on-site training was highly useful and expressing general satisfaction with the training materials. Five teams wrote for funding from other grant sources than Carl D. Perkins to assist them in implementing their unit activities with $13,000 awarded. Thirty-seven teachers of the 40 responding to the survey indicated that they wished to be included in second year activities. Project teachers have reported increased feelings of collegiality. Administrative support in the majority of the districts has been strong and consistent. Four of the six districts were already involved in systemic change through another Carl D. Perkins project and viewed this series of staff development opportunities as enhancing those larger efforts.

This project represents a partnership between six Alaskan secondary school districts, the Department of Vocational Teacher Education, University of Anchorage Alaska, and the Alaska Department of Education for the purpose of demonstrating effective ways to integrate academic and vocational education in rural Alaskan schools.

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Abstract

The purpose of this study was to assess the effectiveness and impact of computer-mediated communication (CMC). This study focused on the use of electronic mail (e-mail) by an identified group of academic and vocational educators in Alaska to communicate with colleagues and educational researchers affiliated with the National Ce. ~er for Research in Vocational Education (NCRVE). This study was part of a 3-year, staff development training project for the integration of academic and vocational education and higher order thinking skills strategies. A descriptive inquiry of 53 participants was conducted to see if CMC reduced feelings of isolation, established collaborative working relationships and enabled participants to gain technical support in curriculum implementation. Descriptive statistics were used to interpret results from a questionnaire designed to measure attitudes and perceived benefits from using e-mail.

Master's Project: Vocational Teacher Education

Donna M Bartman, Master's Candidate

A Fall '92 Live Teleclass

Integrating Academic & Vocational Education

VE 695 Section 801 1 Credit

LIVENET
UNIVERSITY OF ALASKA ANCHORAGE

PROGRAM

A series of LIVENET broadcasts on the topic of integrating academic and vocational education and thinking skills in the secondary curriculum will begin October 14 and continue throughout this school year. The sessions will feature both nationally recognized teacher-educators and Alaskan teachers. This is a federally funded project to demonstrate the integration of academic and vocational education and higher order thinking skills.

Schedule for the 4:00-6:30 p.m. broadcasts:

October 14, 1992 (Wednesday)
Integrating Thinking Skills Across the Curriculum
Dr. Barbara Z. Presseisen, Director, Research for Better Schools

November 16, 1992 (Monday)
The Role of Integration in Systemic Change: The Mat-Su Outcome-Based Education Model

January 11, 1993 (Monday)
Models of Integrating Academic and Vocational Education,
Dr. W. Norton Grubb, National Center for Research in Vocational Education, University of California, Berkley

February 8, 1993 (Monday)
What Works When Teachers Integrate Academic and Vocational Education?
Dr. B. June Schmidt, College of Education, Virginia Polytechnic Institute and State University

March 15, 1993 (Monday)
The Senior Project Model of Integration: Sitka High School

April 12, 1993 (Monday)
Alaska Model Demonstration Project

DELIVERY

Students at remote locations are connected with campus by satellite delivered video and audio.

Students at a distance have a toll-free phone line on which to call the campus classroom so they can ask questions of the televised instructor or have a discussion with their fellow students.

TECHNOLOGY

The challenge of bringing higher education to the remote corners of Alaska has resulted in a space-age collaboration between the University of Alaska Anchorage and Alascom Inc. Alascom's *Aurora II* satellite now transmits select university courses statewide over UAA's LIVENET (Live Interactive Video Education NETwork). LIVENET allows Alaskan students to actively participate in courses originating from a university classroom hundreds of miles away.

To participate in a LiveNet course you must be able to receive the LiveNet satellite signal from Aurora II, transponder 16, audio 5.8. For other viewing possibilities in your area, call UAA Distance Education.

REGISTRATION

FEES: $15 Credit recording fee and $27 Distance Education fee = $42. To register, send completed registration form plus your check for $42 made out to the University of Alaska Anchorage to:

Kim Stanford
UAA Distance Education, K-102
3211 Providence Drive
Anchorage, AK 99508

(907) 786-1626,
or outside Anchorage, (800) 478-2001

Textbooks for this course can be ordered from the UAA Bookstore by calling Gigi at 786-4759. You may use either your VISA or MasterCard and your books will be mailed to you.

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CONCEPT OUTLINE

Step One: Concept Outline

The first step in the design of an integrated academic and vocational education unit is to select appropriate instructional problem or concept. A brief concept outline is developed by the team of teachers.

Title: Construction Materials Calculation
Team: Randy Hughey, Woods, Sitka High School
Cheryl Giradot, Mathematics, Sitka High School

Question: How to achieve accurate project material pricing.

Areas of Study

- Print reading/Spatial visualization
- Linear measurement - one dimension
- Area measurement - two dimensions
- Volume measurement - three dimensions
- Project material pricing

Methods

- Industry presenter
- Hands-on cooperative groups - manipulatives
- Lecture
- Paper and pencils activities

End Projects

- Students will be able to estimate and calculate project prices

*Note: The source for this instruction planning"template" was developed by Dr. Peter Larsen in the Alaska Department of Education publication Content Connections: Creating Interdisciplinery Units, 1991.

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Step Two: Content Outline

The next step is to add more substance to the chosen problem. By completing a content outline the various parts of the unit are coordinated, important topics are not overlooked and the content outline can aid in the writing of assessment measures.

Content Outline

Title: Construction Materials Calculation

I. Print Reading/Spatial Visualization
   A. Identify front, right and top view.
      1. students use rotated blocks to draw three views.
      2. from isometric sketches, students draw three views.
   B. Draw oblique sketches from objects.
   C. Develop skill in print reading.
      1. use simple prints to supply missing dimensions.
      2. identify hidden, center and object lines.

II. Linear Measurement - One Dimension
   A. English system measurement skills.
      1. activities using 1/2, 1/4, 1/8, 1/16 progressively
         a. overhead transparency overlays
         b. "positional' measurement
         c. measurement picture activity
         d. students use tape measures to measure board
   B. Application of linear measurement in industry
      1. dimensional lumber
      2. trim and moldings

III. Area Measurement - Two Dimensions
   A. Develop understanding of Area
      1. tile exercise to discover area formula
   B. Application of area in industry
      1. stain coverage exercise
      2. material calculation from prints
      3. plywood sheets calculation

IV Volume Measurement - Three Dimensions
   A. Develop concept of volume
      1. cube exercise to discover volume formula
      2. meaning of "board foot" using cube model
   B. Application of volume to industry
      1. board footage formula and calculations
      2. rounding rules of industry

V. Project Material Pricing

A. Surface area (square foot)

1. reinforce concept of area and applications
2. scale model material cut-out
    a. most efficient material use
    b. hand in scrap for grade
3. from given print, sketch layout and calculate price of material

B. Volume (board foot)

1. reinforce concept of volume and applications
2. use cutting board to calculate board footage and price by species
3. from print of lattice cabinet, estimate board footage and figure price
4. from print of frame, figure board footage and price

C. Multi-dimensional material calculations

1. from a simple print, figure board feet, square feet and linear feet, and calculate cost
2. from a series of increasingly complex prints, figure material costs

Step Three:

The Planning Prototype is a tool to ensure that content will be covered while students are challenged to use all levels of cognition and employ creative thinking strategies when accomplishing the Integrated unit.

Planning Prototype Sheet

Major Heading	Recall (R)	Analysis (A)	Comparison (C)	Inference (I)	Evaluation (E)	Creativity (Cr)
I Print reading 1 Spatial Visualization	1R, 2R G,D	1A G,D	1C G,D			
II One Dimension Linear	3R G,D,W	2A W				
III Two Dimensions Area			2C W,G	1I G		
IV Three Dimensions Volume	4R W		3C W,G	2I G		
V Project Material Pricing		3A,4A G,W	4C W,G		1E W,G	

Directions for "cracking the code"

1. Major headings refer back to content outline.
2. A code is developed for each objective teachers intend to write within that thinking process.

Thinking Process	Brief Statement
Recall	Recall objectives emphasize the student's ability to remember facts, specific information, or definitions.
Analysis	Analysis objectives emphasize determining the attributes or characteristics of a concept or problem, or comparing and constrasting alternatives.
Comparison	Comparison objectives emphasize determining or explaining similarities and differences.
Inference	Inference objectives ask the student to use both deductive and inductive reasoning.
Evaluation	Evaluation objectives deal with making judgements and decisions.
Creative Thinking	These objectives are open-ended and stress fluency, flexibility, originality, or elaboration in thinking.

Step Four: Instructional Objectives/Learning Activities

Objectives help the teacher determine what it is they want students to learn and what they want to measure to determine if instruction has been successful.

Instructional Objectives Activities Worksheets

Code	Instructional Objectives	Planned Activity	Group Size
1R / G,D	Given a 3-D object, students will identify and draw front top and right side views.	A object is placed on bench in center of group and rotated; students sketch.	4
1A / G,D	Given an isometric sketch, students will draw 3 views.	Given an isometric sketch, each student draws 3 views.	1
1C / G,D	Students will read simple prints.	Given a print, students will locate missing dimensions from alternative views.	2
2R / G,D	Given a print, students identify object, hidden and center lines.	Lecture and board demonstration.	All
3R / G,D,W	Students will read and use an English system ruler to 1/16".	-overhead overlays -large ruler group activities -reinforcement activities	All
2A / W	Students will differentiate dimensional lumber from sheet goods and hardwoods, and measure each.	Lectures and illustrations.	All
1I / G	Students will discover area formula	Students use tile manipulatives to personally discover the area formula.	2

2C W,G	Students will apply area formula to woods industry situations.	Stain coverage and material calculations activity.	2
2I G	Students will discover volume formula.	Students use cube manipulatives to personally discover the volume formula.	2
3C W,G	Students will understand the concept of board feet.	Illustrations and activities to estimate board feet.	All
5R W,G	Students will apply volume formula to industry situations using board feet.	Worksheets and reinforcement activities.	1
1E W,G	Students evaluate efficient material use options.	Students cut out scale models of materials and are graded on efficiency.	2
4C W,G	From given print, students will sketch material layout and calculate price.	Variety of worksheets.	1
3A W,G	Students calculate board feet of each species.	Given cutting boards and lattice boxes, students calculate board feet.	2
4A W,G	From a print, students calculate board feet, square feet, linear feet and cost.	Prints and worksheets	1

Step Five: Measurement Procedures

The final step in developing the integrated unit is to identify "evidence" to determine whether a student has learned a certain objective. In this planning prototype recommended that assessment be measured in three ways - oral feed back; paper-pencil tests or observation of performance.

Assessment Planning Chart

Grade level: 9-12 | Subject: Project Materials Pricing | Topic: Geometry/Woodworking

Code	Oral	Test	Performance
1R G,D			Students sketch 3 views.
1A G,D		Exam	Students sketch 3 views.
1C G,D		Worksheet	
2R G,D	Questioning	Exam	
3R G,D,W		Exam	Measurement Activities.
2A W	Questioning		
1I G			Use tiles to build examples.
2C W,G		Exam	Stain and materials activities.
2I G			Use cubes to build examples.
3C W,G		Exam	144 cubes activities.
5R W,G		Exam	
1E W,G			Scale model cutouts.

Code	Oral	Test	Performance
4C W,G		Exam	
3A W,G			Cutting board and lattice box activity
4A W,G		Exam	Print work