Phase II of a two-part project, this study was conducted in Missouri to develop a quantitative competency matrix for each of the vocational and technical education service areas represented in Missouri. (A description of both phases of the project appears in ED 018 918.) After a literature search identified the affective work competencies desired by industry and education, an Affective Work Competency Inventory (AWCI) was developed to measure them. Since desired worker competencies vary among different occupations, it was necessary to design a quantitative competency matrix for the twenty-four distinct occupational clusters that exist in Missouri. (Each of these occupational clusters is a component in one of the six vocational service areas.) Nine thousand inventories were printed and administered to workers, supervisors, teachers, and students, representing the twenty-four clusters. Following an analysis of the Inventory's results, it was determined that AWCI scores did differentiate among the occupational clusters.

Recommendations for effective use of this data include the following: (1) development of curriculum materials to instruct students in affective work competencies; (2) conduct of experimental programs to determine which teaching methods are effective and to what degree students retain the competencies they acquire; and (3) provision of teacher education programs and inservice workshops to acquaint vocational education teachers with effective methods for teaching the competencies to their students. (Attachments show the occupational matrix and the cluster-occupational index of competency magnitudes.)
FINAL REPORT

AFFE.CTIVE WORK COMPETENCIES
Phase II

(Project No. 1368)

David P. Beach
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July 31, 1978

Missouri Department of Education
Research Coordinating Unit
Jefferson City, Missouri 65101
ABSTRACT

Dates: May 1, 1978 to June 30, 1978

Title: Effects of Vocational Education Programs and AWCI-Assessment Feedback on Student Achievement of Affective Work Competencies

Statement of Problem: To develop a quantitative competency matrix for each of the different vocational and technical education service areas represented in Missouri.

Objectives: 1. Prepare a category-classification system that specifically delineates occupational groups in Missouri.

2. Identify and select representative samples of employed workers within each occupational group.

3. Administer the AWCI to each group.

4. Analyze resulting AWCI-Assessment data to prepare a "Cluster-Occupational Index" of competency magnitudes for each occupational cluster.

5. Perform statistical analysis to test Ho.

6. Disseminate results.

Procedures: After thorough review and synthesis of literature and research, a listing of affective work competencies (AWC's) identified by industry and educators was assembled. The AWC Inventory was developed from this listing. Initial content validation and pilot-test reliabilities were established. To delineate the affective competency requisites within each of the vocational and technical occupations, an occupational matrix was designed. Statistically representative samples of students and workers were randomly selected and the inventory standardization was begun. An interim report and journal articles were published to document and disseminate progress of the project.

Results: Multiple regression procedures were used to analyze the variation of Affective Work Competencies Inventory (AWCI) scores for study participants. It was found that the mean composite AWCI scores for occupational cluster areas were significantly different.

Recommendations: For effective utilization of this data, it will be necessary to develop curriculum materials that will help students acquire the identified and quantified affective worker characteristics. Experimental programs should be conducted to determine which instructional procedures are effective and to what degree students retain the affective competencies they acquire.
A. STATEMENT OF PROBLEM

The successful worker's requisites of skill and knowledge are different among occupations. For example, the electronics technician's cognitive and psychomotor requisites are very different from those of an auto mechanic.

A recent literature search has revealed that the necessary affective worker competencies are also different among occupations. To properly utilize the Affective Work Competencies Inventory, a quantitative competency matrix should be developed for each of the different vocational and technical education service areas represented in Missouri.

B. OBJECTIVES

1. Prepare a category-classification system that specifically delineates occupational groups in Missouri.

Result: To facilitate the synthesis of a category-classification system, researchers reviewed state department publications in addition to the following: Standard Industrial Classification text, Bureau of Census Data, Occupational Outlook Handbook, Dictionary of Occupational Titles, Vocational Education and Occupations Handbook.

Major occupational groups were identified and vocational school placement records were utilized to select primary categories. The resulting occupational matrix includes 24 distinct occupational cluster areas (Attachment A).
Comments: Each of the occupational clusters is incorporated as a component within one of the six vocational service areas. The Trade and Industrial service area contains six occupational clusters; the Distributive area contains two occupational clusters; and each of the remaining four service areas contains four occupational clusters.

2. Identify and select representative samples of employed workers within each occupational group.

Results: State Fair Community College's "Statewide Job Placement Service" provided the initial employer identification list. Personnel managers and/or company representatives were contacted: approximately 60 workers were selected for each of the 24 cells within the occupational matrix.

Comments: Both supervisors and workers from rural, urban and suburban areas were asked to participate in the study.

3. Administer the AWCI to each group.

Results: After appropriate quasi-cluster sampling procedures had been established, nine thousand inventories were printed and administered to students, teachers, supervisors and workers throughout Missouri.

Comments: Data collection was insufficient for 3 of the 24 occupational clusters: Community Health Aide, Dental, and Cosmetology.

4. Analyze resulting AWCI-Assessment data to prepare a "Cluster-Occupational Index" of competency magnitudes for each occupational cluster.

Results: The AWCI scores of workers were analyzed according to 24 different occupations from six service areas for each of the fifteen AWC clusters. The scores for each occupation were normalized with the highest numbers representing the greatest degree of affective work competencies possessed. Insufficient data was available for three of the occupations. The results of this analysis revealed that within each of the six service areas, the following occupations scored consistently highest: Sales (Distributive), Production (Agriculture), Secretarial (Business and Office), Medical Emergency Technician (Health), Institutional Management (Home Economics), and Automotive (Trade and Industrial). (Attachment B)
Comments: The normalizing equation is represented below:

\[ Y = \alpha + \theta X \]

where \( X \) = mean AWCI score for the occupational cluster

\( \theta \) = interval coefficient of 100

\( \alpha \) = regression constant of -350

\( Y \) = occupational index for AWC

5. Perform statistical analysis to test \( H_{01} \): "There will be no difference in the mean scores of affective work competency magnitudes, as measured by the AWCI for different occupational clusters."

Results: The SAS (Statistical Analysis System) computer procedure provides a multiple regression analysis for balanced or unbalanced data. For the null hypothesis, this procedure was used to ascertain whether or not the variation of the dependent variable (AWCI cluster composite) is statistically significant.

Table I presents the results of the statistical analysis of testing \( H_{01} \).

\begin{table}[h]
\centering
\begin{tabular}{lcccc}
\hline
Source & df & SS & MS & F  \\
\hline
MODEL & 21 & 67,650.57 & 3221.46 & 2.65*  \\
ERROR & 1235 & 1,499,345.93 & 1214.05 &  \\
\hline
\end{tabular}
\end{table}

* Significant at the 0.0001 level
**Comments:** For a two-tailed test to be significant at the 0.0061 level, with 21 and 1235 degrees of freedom, an F-value of 2.51 is required. As indicated in Table 1, the obtained F-ratio for the dependent variable was 2.65. Consequently, because the mean scores of affective work competency magnitudes for different occupational clusters was significantly different, as measured by the AWCI, Hypothesis 1 was rejected.

6. Disseminate results.

**Result:** Final dissemination document: (Attachment C)


**C. POPULATION AND SAMPLES**

The population was limited to randomly selected persons currently residing in Missouri. The following samples were utilized:

1. A statistically representative sample of workers and supervisors with demonstrated Affective Work Competencies. This sample was selected by a random sampling technique. Information on the workers was solicited from immediate work supervisors.

2. A statistically representative sample of twelfth grade vocational students and teachers. This sample was selected by a multi-stage random sampling technique.

3. A statistically representative sample of twelfth grade non-vocational students. This sample was selected through the same method as the vocational student sample.
D. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Multiple regression procedures were used to analyze the variation of Affective Work Competencies Inventory (AWCI) scores for study participants. It was found that the mean composite AWCI scores for occupational cluster areas were significantly different.*

Recommendations

Empirical data are available regarding the affective characteristics that successful workers possess. For effective utilization of this data, it will be necessary to develop curriculum materials that will help students acquire those identified and quantified affective work competencies. Additionally, experimental programs should be conducted to determine which instructional procedures are effective and to what degree students retain the affective competencies they acquire.

To acquaint vocational and technical education teachers with the educational strategies, teaching methods, and instructional materials that can help them present the affective work competencies more effectively to their students, appropriate teacher education programs, in-service workshops, and related information must be provided.

*significant at the 0.0001 level
TOTAL OF 20 CELLS - 60 SAMPLES PER CELL

TOTAL SAMPLES DESIRED

INFLATE EACH CELL 10% = 66 SAMPLES
ATTACHMENT B

Cluster-Occupational Index
of Competency Magnitudes
### Figure 1 --- Occupational Cluster Indices

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<th>Occupation</th>
<th>Dedicated/Dependent</th>
<th>Honest/Dependent</th>
<th>Open/Local/Conservative</th>
<th>High Goal/Leadership</th>
<th>Tactful/Patient</th>
<th>Emotional Stabilizes</th>
<th>Friendly/Chores</th>
<th>Independent/Initiative</th>
<th>Considerate/Resourceful</th>
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*Note: The table above presents the occupational cluster indices for various jobs. The indices are based on traits such as dedicated/dependent, honest/dependent, open/local/conservative, high goal/leadership, tactful/patient, emotional stabilizes, friendly/chores, independent/initiative, considerate/resourceful, adaptable/helpful, and cooperative/helpful.*