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ABSTRACT

The purpose of this study was to determine if the 55 test specifications for the Praxis I: Academic Skills Assessments computer-based tests (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) were judged to be appropriate for entry-level vocational education teachers regardless of specialty area. The test specification statements were mailed to a random sample of 5,610 vocational education teachers representing 11 specialty areas. Useable surveys were returned by 2,347 vocational education teachers. Judgments of importance were made using a 5-point rating scale. A test specification statement was considered to be appropriate for entry-level vocational education teachers if respondents from at least 9 or 11 specialty areas judged it to have a mean importance greater than 3.0 (moderately important). The results indicated that all 55 test specifications received mean ratings above 3.00 by respondents from all 11 specialty areas. It may be concluded from the results that the test specification statements for the Praxis I: CBT and the Praxis 1 PPST are appropriate for entry-level vocational education teachers regardless of the specialty area in which they teach. One table. Appendixes present the survey and respondent information. (Contains 2 references.) (Author)

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THE PRAXIS SERIES
Professional Assessments for Beginning Teachers™

A Transportability Study of the Praxis I: Academic Skills Assessments Computer-Based Test (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) Specification Statements for Entry-Level Vocational Education Teachers

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A Transportability Study of the Praxis I: Academic Skills Assessments Computer-Based Test (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) Test Specification Statements for Entry-Level Vocational Education Teachers

Richard J. Tannenbaum, Michael Rosenfeld, and Charles J. Teryek

Abstract

The purpose of this study was to determine if the 55 test specification statements for the Praxis I: Academic Skills Assessments computer-based tests (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) were judged to be appropriate for entry-level vocational education teachers regardless of specialty area. The test specification statements were mailed to a random sample of 5,610 vocational education teachers representing 11 specialty areas. Useable surveys were returned by 2,347 vocational education teachers. Judgments of importance were made using a 5-point rating scale. A test specification statement was considered to be appropriate for entry-level vocational education teachers if respondents from at least 9 of 11 specialty areas judged it to have a mean importance greater than 3.00 (*moderately important*). The results indicated that all 55 test specifications received mean ratings above 3.00 by respondents from all 11 specialty areas. It may be concluded from the results that the test specification statements for the Praxis I: CBT and the Praxis I: PPST are appropriate for entry-level vocational education teachers regardless of the specialty area in which they teach.

A Transportability Study of the

Praxis I: Academic Skills Assessments Computer-Based Test (CBT)

and the Praxis I: Pre-Professional Skills Tests (PPST) Test Specification

Statements for Entry-Level Vocational Education Teachers

The purpose of this study was to determine if the reading, writing, and mathematics skills reflected in the test specification statements for the Praxis I: Academic Skills Assessments computer-based tests (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) are judged to be important for entry-level vocational education teachers. In particular, this study was designed to determine if the test specification statements are judged to be important by vocational education teachers who represent the range of specialty areas within vocational education.

Background

A job analysis study conducted by Rosenfeld and Tannenbaum (1991) identified reading skills (n = 27), writing skills (n = 17), and mathematics skills (n = 15) important for entry-level teachers. These 59 basic skills were judged to be important for all entry-level teachers regardless of subject area or grade level taught. Judgments of importance were obtained from 2,269 teachers.

These 2,269 teachers responded to a mail survey that included a total of 78 statements defining specific reading, writing, and mathematics skills. The basic skill statements were developed by committees of teachers, teacher educators, and state administrators. The surveyed teachers used the following rating scale to make their judgments of basic skill importance: "Regardless of the subject area or grade they teach, how important is it that all entry-level teachers be able to do the following?" The scale values were: 1 (*of no importance*), 2 (*of little importance*), 3 (*moderately important*), 4 (*very important*), and 5 (*extremely important*).

Mean importance ratings were computed by the following subgroups of teacher respondents: (a) *sex* (female, n = 1,457; male, n = 791); (b) *race/ethnicity* (Black, n = 137; White, n = 1,978; Hispanic, n = 42); (c) *teaching experience* (≤ 5 yrs, n = 186; 6-10 yrs, n = 315; 11-15 yrs, n = 470; 16-20 yrs, n = 545; ≥ 21 yrs, n = 730); (d) *school setting* (urban, n = 622; suburban, n = 783; rural, n = 820); (e) *school level* (elementary, n = 647; middle, n = 653; secondary, n = 897); (f) *geographic region* (Northeast, n = 515; Central, n = 593; Southern, n = 558; Far West, n = 580); and (g) *subject taught* (business and vocational education, n = 110; social sciences, n = 225; physical and biological sciences, n = 194; mathematics and computer science, n = 263; language arts, n = 364; special education, n = 185).

The 59 reading, writing, and mathematics skills were judged to be important by each of the subgroups of teachers. Importance was defined as a mean rating of 3.50 (midpoint between *moderately important* and *very important*) or higher. These 59 important basic skills were used to develop test specification statements for the Praxis I: CBT and the Praxis I: PPST. (The actual test specifications consist of 55 individual reading, writing, and mathematics statements. The reduced number of statements reflects the fact that some of the mathematics statements were combined during the development of the test specifications.)

Rationale

The American Vocational Association (AVA), represents 13 specialty areas: (a) Agricultural Education, (b) Business Education, (c) Employment and Training, (d) Guidance, (e) Health Occupations Education, (f) Home Economics Education, (g) Marketing Education, (h) Special Needs, (i) Technical Education, (j) Technology Education, (k) Trade and Industrial Education, (l) Administration, and (m) New and Related Services. This range of specialization within the field of vocational education was not included in the 1991 job analysis study. The purpose of that study

was to identify reading, writing, and mathematics skills that were judged to be important for all entry-level teachers regardless of subject area or grade level taught. As indicated above, teachers representing six subject areas, including business and vocational education teachers (n = 110), were surveyed to identify the important basic skills. Because a generalizable core of important basic skills was to be established, no attempt was made to determine the importance of the basic skills for specialty areas within any of the six major subject areas. Therefore, it is not known if the developed test specification statements for the Praxis I: CBT and the Praxis I: PPST are considered to be important by vocational education teachers across the various specialty areas.

The objective of the present study was to determine if teachers representing the different specialty areas within vocational education judge the 55 test specification statements for the Praxis I: CBT and the Praxis I: PPST to be important for entry-level vocational education teachers.

Method

The 55 reading, writing, and mathematics skill statements that make up the test specifications for the Praxis I: CBT the Praxis I: PPST were mailed, in survey format, to a large sample of vocational education teachers (see the sampling plan section). One week after the initial mailing, a postcard was mailed reminding the teachers to complete and return the survey. Consistent with the original job analysis study, the surveyed vocational education teachers were asked to use the following rating scale to make their judgments of importance: "Regardless of the subject area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?" The scale anchors ranged from a low of 1 (*of no importance*) to a high of 5 (*extremely important*).

The survey also contained a section that asked the vocational education teachers to describe their demographic characteristics (e.g., specialty area in which they teach, state in which they teach, academic degree, race/ethnicity, sex). The demographic information was used to

describe the characteristics of the survey respondents and to conduct the appropriate statistical analyses. A copy of the survey is presented in Appendix A.

Sample of vocational education teachers

A sample of 5,610 vocational education teachers was randomly selected from the membership of the AVA. This sample represents the random selection of 510 vocational education teachers from each of 11 specialty areas. (Two specialty areas, Administration and New and Related Services, were not included in the sample. These two areas are primarily concerned with administration and not with the teaching of vocational education.) This sample size was chosen to ensure that a sufficient number of vocational education teachers from each of the 11 specialty areas would be represented and was based upon an expected response rate of between 40% and 50%. This range is typical of previous surveys conducted by Educational Testing Service (ETS) of knowledge, skills, and abilities important for entry-level teachers in a variety of subject areas.

Analyses

The number and percentage of survey respondents were computed for each demographic characteristic (e.g., specialty area, geographic region, sex). Mean importance ratings for each of the 55 test specification statements were computed for the aggregate of the 11 specialty areas. This analysis provides an overall summary of the distribution of mean importance ratings. Means were also computed separately for each specialty area. This analysis supports the primary objective of the study by "flagging" any statements not judged to be important across the specialty areas. (Mean importance ratings were not computed by any other demographic subgroup. An extensive subgroup analysis of basic skill importance is reported by Rosenfeld and Tannenbaum (1991). Lastly, product-moment correlations of the profile of mean importance ratings for the 11 specialty areas were computed. Correlations provide an indication of agreement among the specialty areas in terms of the relative importance of the test specification statements. This

analysis produces a matrix of 55 correlations. The arithmetic average (Fisher-Z transformed) of these 55 correlations was computed to provide a summary index.

Decision criteria for transportability

The purpose of the job analysis study (Rosenfeld & Tannenbaum, 1991) upon which the current transportability study is based was to identify basic skill statements that were judged to be important for all entry-level teachers. The objective was to develop test specifications appropriate for all entry-level teachers regardless of subject area or grade level taught. To meet this particular objective, a stringent criterion was established: each of 26 subgroups of teachers was required to have judged a basic skill statement to have a mean importance rating of 3.50 or higher. These 26 subgroups were defined by the seven major demographic classifications described previously (e.g., sex, race/ethnicity, subject area). This level of stringency was necessary to ensure, to the extent possible, that only important basic skills were included in the development of the test specification statements for the Praxis I: CBT and the Praxis I: PPST.

The objective of the current study, however, was to determine the judged appropriateness of the test specification statements specifically for entry-level vocational education teachers. To meet this particular objective, the following criterion was established: respondents from 9 of 11 specialty areas must judge a test specification statement to have a mean importance rating greater than 3.00 (*moderately important*). Agreement among 9 of 11 specialty areas represents a statistically significant majority; and a mean value signifying moderate importance comports with the language of the Standards for Educational and Psychological Testing (AERA et al., 1985).

Results

Response rate

Of the 5,610 surveys mailed to the vocational education teachers, 2,347 were returned and coded for data analysis; 75 additional surveys were returned but not coded for data analysis.

These 75 surveys either were not received by the intended vocational education teacher because of an invalid mailing address or were not responded to because, e.g., the survey recipient was retired or not a teacher of vocational education, or were not returned to ETS within an 8-week time period, the operational cutoff for accepting survey responses. (The vocational education teachers were asked to return their completed surveys within 10 days of receipt.) The response rate, adjusted for the 75 unusable surveys, was 42%. As noted above, this response rate is consistent with those of other surveys conducted by ETS of knowledge, skills, and abilities important for entry-level teachers.

Frequency distributions by specialty area

The number and percentage of survey respondents by each of the 11 specialty areas are presented in Table 1. More than 2,000 respondents identified themselves by 1 of the 11 specialty areas (132 identified themselves by the Other category). Business Education (n = 249), Trade and Industrial Education (n = 247), Home Economics Education (n = 244), and Health Occupations Education (n = 227) were represented by the largest number of respondents. Employment and Training (n = 85) was represented by the smallest number of respondents. All of the 11 specialty areas, nonetheless, had a sufficient number of respondents for the necessary statistical analyses to be conducted.

Demographic make up of survey respondents

(The number associated with a percentage will vary by the frequency of nonresponses for the particular demographic variable.) Appendix B includes a detailed account of the demographic make up of the survey respondents. Most of the respondents were teachers (62%, n = 1,388). Sixty-two percent (n = 1,409) had more than 10 years of teaching experience. Females constituted 55% (n = 1,283) of the respondents. The majority were White (85%, n = 1,942). More than half (55%, n = 1,250) had either a master's degree or a master's degree plus additional

credit. Seventy-eight percent (n = 1,825) worked either in the central or southern regions of the country.

Table 1
Frequency Distributions by AVA Specialty Area

Specialty Area	N	%
Agricultural Education	180	8.4
Business Education	249	11.6
Employment and Training	85	4.0
Guidance	141	6.6
Health Occupations Education	227	10.6
Home Economics Education	244	11.4
Marketing Education	184	8.6
Special Needs	152	7.1
Technical Education	121	5.7
Technology Education	179	8.4
Trade and Industrial Education	247	11.5
Other	132	6.2
Total	2,141	

Overall distribution of mean importance ratings

The means for the 55 test specification statements were computed for the aggregate of the 11 specialty areas. All the means exceeded 3.50 (midpoint between *moderately important* and *very important*). There were 23 statements (42%) with a mean importance rating between 3.50 and 4.00; and there were 27 statements (49%) with a mean importance rating between 4.00 and 4.50. The mean for five statements exceeded 4.50. These five statements, in descending order of importance, were: (a) Writing -- delineate the steps in a process or procedure (M = 4.68), (b) Reading -- determine the main idea or gist of a reading selection (M = 4.66), (c) Reading -- use the

table of contents, selection headings, index, and similar sections of a book to locate information (M = 4.61), (d) Writing -- organize ideas effectively and logically (M = 4.56), and (e) Reading -- locate important ideas in a reading selection and explain why these ideas are important (M = 4.52).

Mean importance ratings by specialty area

Appendix C includes the mean importance ratings for each of the specialty areas. All 55 test specification statements received mean ratings above 3.00 by respondents from all 11 specialty areas. In fact, 98% of the mean ratings (593 out of 605) were above 3.50 (midpoint between *moderately important* and *very important*).

Correlation of profiles of mean importance ratings by specialty area

The intercorrelation matrix for the 11 specialty areas is presented in Appendix D. The correlations ranged from a low of .55 to a high of .95; the average correlation (z-transformed) was .84. All 55 correlations were statistically significant ($p < .01$). The results of the correlational analysis indicate a high level of agreement among the specialty areas in terms of the relative importance of the test specification statements.

Summary and Conclusion

A previous study by Rosenfeld and Tannenbaum (1991) identified reading, writing, and mathematics skills judged to be important for all entry-level teachers regardless of subject area or grade level taught. Teachers representing six subject areas, including business and vocational education teachers (n = 110), were surveyed to identify the important basic skills. Because a generalizable core of important basic skills was to be established, no attempt was made to determine the importance of the basic skills for specialty areas within any of the six major subject areas. These important basic skills were used to develop 55 test specification statements for the Praxis I: CBT and the Praxis I: PPST. The purpose of the current study was to determine if these

test specification statements were judged to be appropriate specifically for 11 specialty areas within vocational education.

The test specification statements were mailed to a random sample of 5,610 vocational education teachers (510 per specialty area). Useable surveys were returned by 2,347 vocational education teachers (adjusted response rate of 42%). Judgments of importance were made using a 5-point rating scale. A test specification statement was considered to be appropriate for entry-level vocational education teachers if respondents from 9 of 11 specialty areas judged it to have a mean importance greater than 3.00 (*moderately important*). The results indicated that all 55 test specification statements received mean ratings above 3.00 by respondents from all 11 specialty areas. Furthermore, 98% of the mean ratings (593 out of 605) were above 3.50 (midpoint between *moderately important* and *very important*).

It may be concluded from the results that the test specification statements for the Praxis I: Academic Skills Assessments computer-based tests (CBT) and the Praxis I: Pre-Professional Skills Tests (PPST) are appropriate for entry-level vocational education teachers regardless of the specialty area in which they teach.

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American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1985). Standards for educational and psychological testing. Washington, DC: American Psychological Association.

Rosenfeld, M., & Tannenbaum, R. J. (1991). Identification of a core of important enabling skills for the NTE Successor Stage I examination (Report No. 91-37). Princeton, NJ: Division of Applied Measurement Research, Educational Testing Service.

Appendix A

Survey of Reading, Writing, and Mathematics Skills

READING, WRITING, AND MATHEMATICS SKILLS IMPORTANT FOR ENTRY-LEVEL TEACHERS OF VOCATIONAL EDUCATION

By

Educational Testing Service
Princeton, New Jersey

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INTRODUCTION

Educational Testing Service (ETS) is developing a new generation of assessments for the purpose of licensing/certifying entry-level teachers. The inventory that follows is part of our development effort and is designed to gather information concerning the entry-level vocational education teacher's job. (In particular, what reading, writing, and mathematics skills are important for all entry-level vocational education teachers to possess?) It was developed by classroom teachers, college faculty, and state department of education officials, along with ETS staff.

The inventory consists of two parts:

PART I - READING, WRITING, AND MATHEMATICS SKILL STATEMENTS

PART II - BACKGROUND INFORMATION

In PART I you are asked to judge the importance of each reading, writing, and mathematics skill statement for an entry-level vocational education teacher. In PART II you are asked to provide background information that will be used for research purposes only. All the information you provide is completely confidential.

The inventory has been mailed to a national sample of approximately 6,000 vocational education teachers. Its value is directly related to the number of individuals who return their completed inventories. Because you represent a large number of teachers, your responses are extremely important. Please take the time to complete and return the inventory.

PART I - READING, WRITING, AND MATHEMATICS SKILLS

The purpose of this inventory is to determine what you believe are the important reading, writing, and mathematics skills that all entry-level vocational education teachers should possess. On the following pages you will find 55 reading, writing, and mathematics skill statements.

For each skill statement you will be asked to make the following judgment:

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

To familiarize yourself with the content areas and skill statements, you may wish to glance through the inventory before making your judgments.

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

I. READING	IMPORTANCE
A. Understanding the content of a reading selection	
1. Determine the main idea or gist of a reading selection	1 2 3 4 5
2. Locate important ideas in a reading selection and explain why these ideas are important	1 2 3 4 5
3. Identify accurate paraphrases or summaries of ideas in a reading selection	1 2 3 4 5
4. Determine the supporting ideas in a reading selection: ideas, details, or facts that support the author's main idea	1 2 3 4 5
B. Understanding the argument of a reading selection	
5. Recognize the presence of an argument in a reading selection	1 2 3 4 5
6. Determine whether facts or ideas are relevant to an argument in a reading selection	1 2 3 4 5
7. Identify logical assumptions on which the author bases the argument of a reading selection	1 2 3 4 5
C. Understanding the implied content of a reading selection	
8. Perceive what is implied rather than directly stated by the author and make inferences from the directly stated content of a reading selection	1 2 3 4 5
9. Distinguish between what a writer presents as fact from the writer's opinions	1 2 3 4 5
10. Recognize or predict ideas or situations that are extensions of what has been presented in a reading selection	1 2 3 4 5
D. Understanding the organization of a reading selection	
11. Understand how a reading selection is organized (e.g., compare and contrast, problem and solution, description)	1 2 3 4 5
12. Use the table of contents, selection headings, index, and similar sections of a book to locate information	1 2 3 4 5
13. Arrange the ideas in a reading selection into an outline, a concept map, or into some other form of graphic organizer	1 2 3 4 5

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

I. READING (cont.)	IMPORTANCE
14. Identify the relationships among ideas directly stated in the reading selection (e.g., relationships of cause and effect, and sequence)	1 2 3 4 5
15. Locate the place in a reading selection where a specific kind of information can be found (e.g., The author mentions the gestation period of ducks in paragraph?)	1 2 3 4 5
E. Understanding the way in which language is used in a reading selection	
16. Recognize and identify different interpretations that can be made of the same word, sentence, paragraph, or reading selection	1 2 3 4 5
17. Recognize how the meaning of a word, sentence, or paragraph is affected by the context in which it appears	1 2 3 4 5
18. Understand the function of key transition indicators in a reading selection (e.g., "however", "by contrast", in conclusion".)	1 2 3 4 5
F. Understanding other features of a reading selection	
19. Compare or combine ideas or information found in two or more sources .	1 2 3 4 5
20. Identify inconsistencies or differences in points of view in a reading selection or two or more such selection	1 2 3 4 5
21. Specify appropriate reference sources for locating a specific kind of information (e.g., for synonyms, use of a dictionary or a thesaurus; for information about the weather, use a newspaper or almanac.)	1 2 3 4 5
22. Understand reading materials with various writing styles and various difficulty levels	1 2 3 4 5

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Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

II. WRITING	IMPORTANCE
A. Composing Skills	
23. Describe an event or situation	1 2 3 4 5
24. Delineate the steps in a process or procedure (e.g., explain how to do something.)	1 2 3 4 5
25. Support a position for or against something	1 2 3 4 5
26. Analyze ideas and information in various ways, for instance	1 2 3 4 5
-explaining the cause and effect of something -comparing and contrasting different points of view -drawing conclusions based on evidence provided	
27. Provide a clear focus or thesis	1 2 3 4 5
28. Produce and develop supporting material that explains or illustrates key ideas	1 2 3 4 5
29. Organize ideas effectively and logically	1 2 3 4 5
30. Use vocabulary appropriate to the purposes of writing and the audience addressed	1 2 3 4 5
31. Present ideas in writing in an imaginative way	1 2 3 4 5
32. Present alternative points of view in writing	1 2 3 4 5
B. Editing and Revising Skills	
33. Recognize basic grammatical errors in standard written English. These errors might involve:	1 2 3 4 5
-verb forms (had brung) -verb tense (yesterday I am making) -agreement of subject and verb (one of the books are) -pronoun case (between him and I) -punctuation ("it's" when "its" is meant)	

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

II. WRITING (cont.)

IMPORTANCE

34. Recognize effective sentence structure free of problems. These problems might involve: 1 2 3 4 5

-misplaced modifiers (Not this: This computer is seldom used even though it is the most effective because of the high cost. But this: Even though it is most effective, this computer is seldom used because of the high cost.)

-faulty subordination (Not this: Seeing the boat in the water, it hardly looked seaworthy. But this: Seeing the boat in the water, I decided that it hardly looked seaworthy.)

-faulty parallel structure (Not this: She promised to buy a copy of the book and that she would make it available to students. But this: She promised to buy a copy of the book and to make it available to students.)

35. Recognize language that creates and inappropriate and/or inconsistent tone, given the intended audience and or purpose for writing. Such inappropriate language might involve: 1 2 3 4 5

-colloquialisms or slang in a formal report
-sarcasm in a letter when respect is intended

36. Revise sentences to correct basic problems in standard written English. These problems might include: 1 2 3 4 5

-"had went" for "had gone"
-"accept" when "except" is intended

37. Revise paragraphs to create appropriate and consistent tone, given the intended audience and purpose for writing. These paragraphs might be excerpts from: 1 2 3 4 5

-an explanation to a group of students
-a proposal to a school board

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

II. WRITING (cont.)	IMPORTANCE
38. Revise paragraphs to clarify meaning. The revision might address confusion resulting from such problems as:	1 2 3 4 5
-illogical transitions -unnecessary repetition -vague references -imprecise language -irrelevant ideas	
III. MATHEMATICS	
39. Recognize the position of numbers in relation to each other	1 2 3 4 5
40. Recognize equivalent forms of a number, including square roots and powers of a number	1 2 3 4 5
41. Demonstrate an understanding of the characteristics of counting numbers, including prime, even or odd, and multiples or factors	1 2 3 4 5
42. Perform computations in problem solving situations, and adjust the result of computations as required by the problem	1 2 3 4 5
43. Select a sequence of operations that could be used to solve a problem; demonstrate an understanding of fundamental algorithms or procedures . .	1 2 3 4 5
44. Solve problems using estimation	1 2 3 4 5
45. Interpret and apply ratio, proportion, percent, and simple probability . . .	1 2 3 4 5
46. Recognize the relationships among the variables and/or constants in an equation or formula	1 2 3 4 5
47. Write and/or simplify expressions using variables; write and solve simple equations and inequalities; recognize equations and inequalities representing situations presented in words	1 2 3 4 5
48. Read and interpret information contained in various kinds of graphs, charts, and tables	1 2 3 4 5
49. Demonstrate an ability to analyze and summarize numerical data	1 2 3 4 5

Regardless of the subject-matter area or grade they teach, how important is it that all entry-level vocational education teachers be able to do the following?

Circle your response using the 5-point scale adjacent to each statement.

(1) Of no importance
(2) Of little importance
(3) Moderately important
(4) Very important
(5) Extremely important

III.	MATHEMATICS (cont.)	IMPORTANCE
50.	Demonstrate an understanding of average (arithmetic mean) and range of a set of data; given the appropriate definition determine or interpret the median or mode of a set of data	1 2 3 4 5
51.	Recognize patterns and spatial relationships	1 2 3 4 5
52.	Determine length, perimeter, area, and volume of common two and three-dimensional geometric figures	1 2 3 4 5
53.	Understand and use various systems of measurement, including the metric and U. S. customary systems; make conversions within the same system or convert units from one measurement system to another using a conversion table	1 2 3 4 5
54.	Interpret sentences containing logical connectives (and, or, if-then) and quantifiers (some, all, none.)	1 2 3 4 5
55.	Draw correct conclusions; use deductive/inductive reasoning to determine whether a conclusion based on a sequence of statements is valid; identify counterexamples to inappropriate conclusions	1 2 3 4 5

PART II - BACKGROUND INFORMATION

The information that you provide in this section is completely confidential and will be used for research purposes only. Please answer the questions by circling the number that most closely describes you or your professional activities. Unless otherwise indicated, please circle only one response for each question.

56. Where do you work?

1. Alabama
2. Alaska
3. Arizona
4. Arkansas
5. California
6. Colorado
7. Connecticut
8. Delaware
9. District of Columbia
10. Florida
11. Georgia
12. Hawaii
13. Idaho
14. Illinois
15. Indiana
16. Iowa
17. Kansas
18. Kentucky
19. Louisiana
20. Maine
21. Maryland
22. Massachusetts
23. Michigan
24. Minnesota
25. Mississippi
26. Missouri
27. Montana
28. Nebraska
29. Nevada
30. New Hampshire
31. New Jersey
32. New Mexico
33. New York
34. North Carolina
35. North Dakota
36. Ohio
37. Oklahoma
38. Oregon
39. Pennsylvania
40. Rhode Island
41. South Carolina
42. South Dakota
43. Tennessee
44. Texas
45. Utah
46. Vermont
47. Virginia
48. Washington
49. West Virginia
50. Wisconsin
51. Wyoming

57. What is your age?

1. Under 25
2. 25-34
3. 35-44
4. 45-54
5. 55-64
6. Over 64

58. What is your sex?

1. Female
2. Male

59. How do you describe yourself?

1. Native American, American Indian, or Alaskan Native
2. Asian American, Asian, Native Hawaiian, or Pacific Islander
3. African American or Black
4. Mexican American or Chicano
5. Puerto Rican
6. Latin American, South American, Central American, or other Hispanic
7. White
8. Other (please specify)_____

60. Which one of the following best describes your highest educational attainment?

1. High School Graduate or GED
2. Two-year Associate's Degree
3. Four-year Bachelor's Degree
4. Bachelor's + Additional Credits
5. Master's
6. Master's + Additional Credits
7. Doctorate

61. Which one of the following best describes the type of school in which you work? If you teach in more than one setting, please select the category in which you spend the most time.

1. Junior High School/Middle School
2. Comprehensive High School
3. Vocational/Technical School
4. Community College/Technical Institute
5. College/University
6. Other (please specify)_____

62. Which of the following best describes the area in which you work?

1. Urban
2. Suburban
3. Rural

63. To which of the following AVA divisions do you currently belong? (Circle all that apply.)

1. Agricultural Education
2. Business Education
3. Employment and Training
4. Guidance
5. Health Occupations Education
6. Home Economics Education
7. Marketing Education
8. Special Needs
9. Technical Education
10. Technology Education
11. Trade and Industrial Education
12. Other (please specify)_____

64. Which one of the following best describes your current employment status?

1. Teacher
2. Administrator Supervisor
3. Teacher Supervisor
4. Teacher Trainer
5. Counselor
6. Other (please specify)_____

65. How many years have you taught vocational education?

1. Never taught vocational education
2. Less than a year
3. 1 - 2
4. 3 - 5
5. 6 - 10
6. 11 - 15
7. 16 - 20
8. 21 or more

66. The subject matter you spend the majority of your time teaching falls under which one of the following AVA divisions?

1. Agricultural Education
2. Business Education
3. Employment and Training
4. Guidance
5. Health Occupations Education
6. Home Economics Education
7. Marketing Education
8. Special Needs
9. Technical Education
10. Technology Education
11. Trade and Industrial Education
12. Other (please specify)_____

THANK YOU FOR COMPLETING THIS INVENTORY.
PLEASE RETURN IT WITHIN 10 DAYS USING THE ENCLOSED ENVELOPE.

Appendix B

Demographic Makeup of Survey Respondents

Demographic Category	N	%	Demographic Category	N	%
GEOGRAPHIC REGION			RACE/ETHNICITY		
Northeast	173	7.5	Native American	113	5.0
Central	949	41.1	Asian American	20	0.9
Southern	876	37.3	African American	135	5.9
Far West	313	13.5	Mexican American	18	0.8
AGE (years)			Puerto Rican	5	0.2
< 25	26	1.1	Hispanic	6	0.3
25-34	194	8.4	White	1942	85.3
35-44	684	29.5	Other	69	1.7
45-54	890	38.3	AVA DIVISION MEMBERSHIPS		
55-64	426	18.4	Agricultural Education	193	8.2
≥ 65	101	4.4	Business Education	310	13.2
SEX			Employment and Training	161	6.9
Female	1283	54.7	Guidance	231	9.8
Male	1037	44.2	Health Occupations Education	243	10.4
SCHOOL SETTING			Home Economics Education	280	11.9
Urban	688	30.7	Marketing Education	229	9.8
Suburban	599	26.7	Special Needs	250	10.7
Rural	954	42.6	Technical Education	208	8.9
			Technology Education	283	12.1
			Trade and Industrial Education	346	14.7
			Other	76	3.2

Demographic Category	N	%	Demographic Category	N	%
TEACHING EXPERIENCE (years)			HIGHEST EDUCATIONAL ATTAINMENT		
Never Taught Vocational Education	96	4.2	High School Graduate or GED	30	1.3
< 1	54	2.4	Two-Year Associate's Degree	118	5.2
1-2	107	4.7	Four-Year Bachelor's Degree	100	4.4
3-5	234	10.3	Bachelor's + Credit	539	23.7
6-10	381	16.7	Master's Degree	243	10.7
11-15	369	16.2	Master's + Credit	1007	44.2
16-20	443	19.4	Doctorate	240	10.5
≥ 21	597	26.2			
EMPLOYMENT STATUS			SCHOOL TYPE		
Teacher	1388	62.4	Junior High School/Middle School	154	6.9
Administrator Supervisor	227	10.2	Comprehensive High School	811	36.3
Teacher Supervisor	112	5.0	Vocational/Technical School	607	27.1
Teacher Trainer	114	5.1	Community College/Technical Institute	269	12.0
Counselor	135	6.1	College/University	169	7.6
Other	247	11.1	Other	226	10.1

Appendix C

Mean Importance Ratings by Specialty Area

	AE N=180	BE N=249	EM N=85	G N=141	H N=227	HE N=244	M N=184	SN N=152	TC N=121	TG N=179	TR N=247
I. READING											
A. Understanding the content of a reading selection											
1. Determine the main idea or gist of a reading selection	4.59	4.70	4.54	4.71	4.76	4.77	4.70	4.68	4.59	4.62	4.50
2. Locate important ideas in a reading selection and explain why these ideas are important	4.36	4.57	4.46	4.65	4.63	4.66	4.61	4.55	4.43	4.38	4.37
3. Identify accurate paraphrases or summaries of ideas in a reading selection	4.03	4.24	4.11	4.38	4.39	4.48	4.28	4.23	4.04	4.02	3.95
4. Determine the supporting ideas in a reading selection: ideas, details, or facts that support the author's main idea	4.05	4.19	4.09	4.35	4.30	4.35	4.22	4.22	3.98	3.94	3.95
B. Understanding the argument of a reading selection											
5. Recognize the presence of an argument in a reading selection	3.80	3.93	3.86	4.14	3.88	4.15	4.00	3.85	3.83	3.73	3.69
6. Determine whether facts or ideas are relevant to an argument in a reading selection	4.05	4.05	4.01	4.19	3.95	4.27	4.09	3.96	3.94	3.86	3.82
7. Identify logical assumptions on which the author bases the argument in a reading selection	3.86	3.92	3.89	4.14	3.88	4.10	4.02	3.87	3.86	3.66	3.69
C. Understanding the implied content of a reading selection											
8. Perceive what is implied rather than directly stated by the author and make inferences from the directly stated content of a reading selection	3.67	3.86	3.89	3.99	3.81	4.03	3.93	3.95	3.59	3.64	3.61
9. Distinguish between what a writer presents as fact from the writer's opinions	4.15	4.26	4.18	4.34	4.17	4.42	4.37	4.33	4.13	4.13	3.97
10. Recognize or predict ideas or situations that are extensions of what has been presented in a reading selection	3.82	3.84	3.85	4.04	3.94	4.11	4.02	3.96	3.74	3.72	3.61
D. Understanding the organization of a reading selection											
11. Understand how a reading selection is organized (e.g., compare and contrast, problem and solution, description)	3.63	3.76	3.87	3.92	4.01	4.03	3.94	3.70	3.74	3.70	3.62
12. Use the table of contents, selection headings, index, and similar sections of a book to locate information	4.53	4.62	4.49	4.65	4.75	4.69	4.55	4.65	4.55	4.55	4.51
13. Arrange the ideas in a reading selection into an outline, a concept map, or into some other form of graphic organizer	3.85	3.91	3.95	4.08	4.12	4.15	4.05	3.97	3.93	3.89	3.81

Note AE = Agricultural Education; BE = Business Education, EM = Employment and Training; G = Guidance; H = Health Occupations Education; HE = Home Economics Education; M = Marketing Education; SN = Special Needs; TC = Technical Education; TG = Technology Education; TR = Trade and Industrial Education

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	AE N = 180	BE N = 249	EM N = 85	G N = 141	H N = 227	HE N = 244	M N = 184	SN N = 152	TC N = 121	TG N = 179	TR N = 247
14. Identify the relationships among ideas directly stated in the reading selection (e.g., relationships of cause and effect, and sequence)	3.85	3.88	4.05	4.17	4.19	4.25	4.15	4.05	3.87	3.88	3.87
15. Locate the place in a reading selection where a specific ding of information can be found (e.g., The author mentions the gestation period of ducks in paragraph?)	4.06	4.05	3.99	4.25	4.28	4.24	4.02	4.26	3.79	3.91	3.96
E. Understanding the way in which language is used in a reading selection											
16. Recognize and identify different interpretations that can be made of the same word, sentence, paragraphs, or reading selection	3.67	3.82	3.95	3.96	3.98	4.05	3.97	3.77	3.58	3.67	3.57
17. Recognize how the meaning or a word, sentence, or paragraph is affected by the context in which it appears	3.90	4.13	4.13	4.18	4.24	4.23	4.16	4.05	3.79	3.93	3.81
18. Understand the function of key transition indicators in a reading selection (e.g., "however", "by contrast", "in conclusion")	3.77	3.93	3.91	3.97	4.05	4.02	4.00	3.87	3.66	3.65	3.64
F. Understanding other features of a reading selection											
19. Compare or combine ideas or information found in two or more sources	4.10	4.11	4.10	4.26	4.28	4.30	4.35	4.16	3.96	4.03	3.89
20. Identify inconsistencies or differences in points of view in a reading selection or two or more such selection	3.98	4.00	4.02	4.17	4.18	4.29	4.14	4.00	3.84	3.90	3.73
21. Specify appropriate reference sources for locating a specific kind of information (e.g., for synonyms, use of a dictionary or thesaurus; for information about the weather, use a newspaper or almanac)	4.14	4.36	4.15	4.30	4.41	4.33	4.37	4.27	3.98	4.08	3.92
22. Understand reading materials with various writing styles and various difficulty levels	3.66	3.77	3.81	3.90	4.01	4.00	3.96	3	3.52	3.57	3.48
II. WRITING											
A. Composing Skills											
23. Describe an event or situation	4.40	4.38	4.43	4.40	4.39	4.47	4.48	4.39	4.23	4.21	4.11
24. Delineate the steps in a process or procedure (e.g., explain how to do something)	4.55	4.65	4.73	4.74	4.76	4.76	4.75	4.72	4.66	4.69	4.53
25. Support a position for or against something	4.20	4.05	4.17	4.37	4.08	4.35	4.29	4.10	3.75	3.97	3.87
26. Analyze ideas and information in various ways	4.23	4.17	4.46	4.48	4.36	4.49	4.43	4.32	4.14	4.25	4.20
27. Provide a clear focus or thesis	4.11	4.21	4.31	4.40	4.24	4.36	4.29	4.21	4.12	4.13	3.95

Note. AE = Agricultural Education; BE = Business Education; EM = Employment and Training; G = Guidance; H = Health Occupations Education; HE = Home Economics Education; M = Marketing Education; SN = Special Needs; TC = Technical Education; TG = Technology Education, TR = Trade and Industrial Education.

	AE N=180	BE N=249	EM N=85	G N=141	H N=227	HE N=244	M N=184	SN N=152	TC N=121	TG N=179	TR N=247
28. Produce and develop supporting material that explains or illustrates key ideas	4.07	4.19	4.22	4.37	4.30	4.38	4.32	4.25	4.17	4.04	4.05
29. Organize ideas effectively and logically	4.49	4.64	4.64	4.62	4.62	4.68	4.59	4.58	4.50	4.46	4.40
30. Use vocabulary appropriate to the purposes of writing and the audience addressed	4.36	4.62	4.53	4.66	4.66	4.65	4.55	4.54	4.36	4.34	4.21
31. Present ideas in writing in an imaginative way	3.71	3.61	3.57	3.72	3.66	3.85	3.83	3.56	3.51	3.53	3.39
32. Present alternative points of view in writing	3.86	3.66	3.53	3.81	3.74	3.95	3.87	3.65	3.37	3.49	3.40
B. Editing and Revising Skills											
33. Recognize basic grammatical errors in standard written English	4.27	4.71	4.17	4.54	4.47	4.60	4.45	4.44	4.13	4.22	3.95
34. Recognize effective sentence structure free of problems	3.83	4.18	3.82	4.04	3.91	4.11	3.98	3.81	3.86	3.78	3.58
35. Recognize language that creates an inappropriate and/or inconsistent tone, given the intended audience and/or purpose for writing	3.96	4.25	3.93	4 14	4.23	4.31	4.10	3.97	3.78	3.88	3.70
36. Revise sentences to correct basic problems in standard written English	4.13	4.59	4.17	4.54	4.42	4.52	4.40	4.37	4.07	4.06	3.80
37. Revise paragraphs to create appropriate and consistent tone, given the intended audience and purpose for writing	4.06	4.36	4.07	4.26	4.18	4.33	4.22	4.15	3.88	3.99	3.77
38. Revise paragraphs to clarify meaning	3.91	4.23	3.99	4.22	4.08	4.20	4.11	4.05	3.94	3.95	3.76
III. **MATHEMATICS**											
39. Recognize the position of numbers in relation to each other	4.38	4.47	4.60	4.59	4.48	4.41	4.49	4.57	4.47	4.47	4.40
40. Recognize equivalent forms of a number, including square roots and powers of a number	3.70	3.41	3.72	3.82	3.26	3.37	3.35	3.68	3.93	3.87	3.73
41. Demonstrate an understanding of the characteristics of counting numbers, including prime, even or odd, and multiples or factors	3.90	3.86	4.18	4.06	3.84	3.92	3.92	4.00	4.07	4.06	3.92
42. Perform computations in problem solving situations, and adjust the result of computations as required by the problem	4.42	4.28	4.35	4.43	4.09	4.32	4.37	4.37	4.31	4.38	4.14
43. Select a sequence of operations that could be used to solve a problem; demonstrate an understanding of fundamental algorithms or procedures	3.87	3.66	3.98	3.86	3.60	3.82	3.71	3.99	4.00	4.02	3.75
44. Solve problems using estimation	4.28	4.10	4.22	4.37	3.78	4.22	4.08	4.27	4.15	4.24	4.11

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	AE N=180	BE N=249	EM N=85	G N=141	H N=227	HE N=244	M N=184	SN N=152	TC N=121	TG N=179	TR N=247
45. Interpret and apply ration, proportion, percent, and simple probability	4.42	4.07	4.13	4.35	4.09	4.23	4.13	4.19	4.21	4.32	4.18
46. Recognize the relationships among the variables and/or constants in an equation or formula	3.82	3.69	3.83	3.93	3.56	3.69	3.71	3.71	3.93	3.93	3.83
47. Write and/or simplify expressions using variables; write and solve simple equations and inequalities; recognize equations and inequalities representing situations presented in words	3.83	3.63	3.82	3.96	3.54	3.76	3.71	3.64	3.91	3.94	3.72
48. Read and interpret information contained in various kinds of graphs, charts, and tables	4.41	4.36	4.46	4.55	4.13	4.51	4.55	4.60	4.35	4.46	4.24
49. Demonstrate an ability to analyze and summarize numerical data	4.19	4.21	4.34	4.34	3.85	4.24	4.38	4.19	4.29	4.21	4.03
50. Demonstrate an understanding of average (arithmetic mean) and range of a set of data; given the inappropriate definition determine or interpret the median or mode of a set of data	4.02	4.01	4.08	4.26	3.80	4.07	4.04	3.95	3.91	4.03	3.81
51. Recognize patterns and spatial relationships	3.76	3.58	3.96	4.06	3.58	3.99	3.71	3.98	3.87	3.95	3.77
52. Determine length, perimeter, area, and volume of common two and three-dimensional geometric figures	4.38	3.47	4.02	4.23	3.37	3.93	3.47	4.16	4.16	4.36	4.08
53. Understand and use various systems of measurement, including the metric and U.S. customary systems; make conversions within the same system or convert units from one measurement system to another using a conversion table	4.04	3.57	3.93	4.15	4.18	3.94	3.55	3.97	4.08	4.38	4.06
54. Interpret sentences containing logical connectives (and, or, if-then) and quantifiers (some, all, none)	3.80	3.85	3.87	3.96	3.80	3.94	3.72	3.83	3.76	3.90	3.64
55. Draw conclusions; use deductive/inductive reasoning to determine whether a conclusion based on a sequence of statements is valid; identify counterexamples to inappropriate conclusions	3.97	3.87	4.01	4.17	3.83	4.10	3.94	3.98	3.92	4.01	3.76

Note. AE = Agricultural Education; BE = Business Education; EM = Employment and Training; G = Guidance; H = Health Occupations Education; HE = Home Economics Education; M = Marketing Education; SN = Special Needs; TC = Technical Education; TG = Technology Education; TR = Trade and Industrial Education.

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Appendix D

Intercorrelation Matrix for Specialty Area

Specialty Area	1	2	3	4	5	6	7	8	9	10	11
1. AE											
2. BE	.74										
3. EM	.86	.80									
4. G	.90	.88	.92								
5. H	.64	.87	.74	.80							
6. HE	.77	.93	.82	.91	.91						
7. M	.73	.93	.83	.86	.88	.95					
8. SN	.90	.85	.93	.95	.79	.88	.84				
9. TC	.87	.68	.89	.85	.58	.66	.65	.86			
10. TG	.91	.62	.87	.84	.55	.63	.58	.85	.95		
11. TR	.91	.67	.91	.88	.65	.70	.67	.89	.95	.95	

Note. AE = Agricultural Education; BE = Business Education; EM = Employment and Training; G = Guidance; H = Health Occupations Education; HE = Home Economics Education; M = Marketing Education; SN = Special Needs; TC = Technical Education; TG = Technology Education; TR = Trade and Industrial Education. All correlations significant at $p < .01$. The average r (z-transformed) = .84.

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