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ABSTRACT

A study examined how West Virginia secondary vocational education (VE) teachers use student assessment information in making instructional decisions. A 5-part questionnaire designed to determine how 6 types of student assessment methods were being used in addressing 10 instructional decisions was administered to a randomly selected cluster sample of 240 of all 647 West Virginia teachers who taught full time in 1997-1998. Of those surveyed, 144 (60%) returned usable questionnaires. Multiple regression analysis was used to determine the variance in the use of assessment information as explained by selected independent variables. The respondents, who averaged 15.02 years of teaching experience and 9.66 years of related work experience, considered information generated from performance assessment the most useful type of assessment information. The remaining five sources of assessment information was ranked as follows (from most to least important): informal observation, objective test items, standardized test scores, essay items, and portfolios. Results suggest that secondary VE teachers need the following in order to make changes that are conceptually meaningful: appropriate materials to try and adapt; time to reflect and develop new instructional approaches, and ongoing support from experts to learn the conceptual bases behind intended reforms. (Contains 18 references.) (MN)

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Influence of Selected Variables on the Use of Different Assessment Methods as Perceived by Secondary Vocational Education Teachers

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Abstract

The purpose of this study was to describe West Virginia secondary vocational education teachers'use of student assessment information in making instructional decisions. The study examined the use of assessment information, obtained from six types of student assessment methods, in addressing 10 instructional decisions. The target population was all teachers in West Virginia who taught full time at secondary technical centers during the 1997-98 school year. A cluster sample of 240 teachers was used for the study. A five-part questionnaire was designed to measure selected variables. Descriptive statistics were used to summarize the data. Multiple regression analyses were used to determine the variance in the use of assessment information as explained by selected independent variables. Respondents had an average of 15 years of teaching experience. Secondary vocational education teachers rated information provided from performance assessments as being of more use in addressing daily classroom decisions than information obtained from the other five methods. To make changes that are conceptually meaningful, secondary vocational education teachers need: appropriate materials to try out and adapt; time to reflect and to develop new instructional approaches, and ongoing support from experts to learn the conceptual bases behind intended reforms.

Influence of Selected Variables on the Use of Different Assessment Methods as Perceived by Secondary Vocational Education Teachers

During the past few years, economic concerns have prompted a number of proposals aimed at reforming federal vocational education and employment training programs. Reports about the inadequate skills of high school graduates, the rapidly changing demands of the workplace, and the declining competitiveness of U.S. firms in the international marketplace have all fueled the idea that the organization and structure of employment preparation programs must change. The 104th congress argued at length about this issue, but Democrats and Republicans were not able to reach a consensus about the shape of future federal vocational education programs.

However, despite the strong differences in their approaches to reform, all sides seem to agree on the need for trustworthy methods for assessing vocational students' skills. A noteworthy example of this convergence can be seen in the continuing debate between those who recommend a greater focus on broad industry skills at the secondary level (Boesel & McFarland, 1994) and those who place more emphasis on occupation-specific skills (Bishop, 1995). Both sides agree about the need for a system that assesses skills in reliable and valid ways. Almost all policy makers think it is essential to measure the degree to which participants have mastered the skills upon which training focuses.

Many vocational educators are advocating the wider use of alternative assessments, such as portfolios, exhibitions, and performance events, for measuring skills of either type. This interest in new measures derives in part from the changes occurring

in vocational education. Educators and employers believe that the work world is changing and vocational education must adapt if it is to serve students well. The changes in the workplace are complex and not completely understood, but most observers believe that future employees will need integrated academic and vocational knowledge, a broad understanding of occupational areas, the ability to interact creatively with their peers, and higher-order cognitive skills that allow them to be flexible, learn rapidly, and adapt to ever-changing circumstances. To the extent this belief is true, vocational training needs to place greater emphasis on integrated learning, critical thinking skills, and connections between vocational and academic skills, rather than on the mastery of narrow, occupation-specific skills that characterized vocational education in the past. This new vision may also require broader changes in vocational education, including rethinking the organization, goals, content, and delivery of services, as well as the manner in which students and programs are assessed (Stecher, et al., 1997).

Theoretical Framework

The American Federation of Teachers, the National Council on Measurement in Education, and the National Education Association (1990) supported the concept of an instructional-assessment linkage by subscribing to the view the "student assessment is an essential part of teaching and that good teaching cannot exist without good student assessment."(p. 1)

Door-Bremme (1983) stated that if testing programs were to be useful for teachers they must take into account teacher's routine thinking and practices in assessing student

achievement. This study also found that the type of assessment methods that teachers rely upon most heavily have three common characteristics:

1. Immediate accessibility: teachers can give them when they choose and see results promptly.
2. Proximity between their intended purposes and teachers' practical activities.
3. Consonance between the content they cover and the content taught. (p. 5)

Door-Bremmer (1983) concluded that teachers perceive their use of assessment methods as accurately measuring the effects of the instruction they provided.

Shulman (1980) believed that a teacher's ability to conduct an array of assessment practices should generate a rich source of useful data for decision making. Shulman (1980) made reference to the assessment practices of a physician in emphasizing the range of activities that a teacher could be expected to perform.

> The physician uses observation, interview, touching and feeling, as well as testing, and develops an assessment and a plan by aggregating across those sources of information rather than by giving almost total weight to any one source and subordinating the others to it. (p. 69)

The demographic and background characteristics of teachers have been recognized as factors which can explain variations in teacher competence and particular teacher use of assessment (Kershaw, 1993). Several teacher background characteristics were found by Newman and Stallings (1982) to be correlated with classroom assessment competency. It was determined that younger teachers, teachers with higher degrees, and teachers with less teaching experience tended to score higher on an instrument which measured an understanding of classroom assessment principles.

State after state has begun to initiate mechanisms, which serve to promote accountability for educational outcomes. California, Connecticut, Iowa, Kansas, Maryland, New Jersey, and Ohio have taken measures to make their educational systems more accountable for student outcomes (McCaslin, 1990; Kershaw, 1993). Pressure has been mounting for vocational educators to become more accountable for learning outcomes of their students. How teachers use assessment information in the classroom and whether its use is effective can play a major role in enhancing and documenting both instruction and learning. How are vocational education teachers using student assessment data? The literature has revealed very little information about the assessment practices of this group of teachers. How vocational education teachers use assessment data must be described if we are to improve critical components of the assessment process.

Purpose and Objectives

The purpose of this study was to describe West Virginia secondary vocational education teachers' use of student assessment information in making instructional decisions. The specific objectives of the study were as follows:

1. To describe secondary vocational education teachers' perceptions of their use of student assessment data for making instructional decisions.
2. To describe secondary vocational education teachers' perceptions of their competence, constraints and attitudes toward the assessment process.
3. To determine the proportion of variance in secondary vocational education teachers' perceived use of assessment information in instructional decision making that could be explained by the independent variables of attitude

towards assessment, competence in the assessment processes, constraints to the assessment process, and selected demographic and background characteristics (gender, age, years of teaching experience, years of related work experience, vocational teaching area, educational level, and certification route).

Method

Population and Sampling

The target population (N = 647) was all teachers in West Virginia who taught full time at secondary vocational technical centers during the 1997- 98 school year. The 1997 - 98 West Virginia Education Directory served as the sampling frame for the study. Using Krejcie and Morgan's (1970), table of sample sizes, a sample size of 240 was identified as representative of a population of 647 within a five percent margin of error. A cluster sampling technique was used to randomly select secondary vocational education teachers from the 32 secondary vocational technical centers in the state of West Virginia. Twelve secondary vocational technical centers were randomly selected to participate in the study in order to achieve the desired sample size of 240 (12 schools with an average of 20 teachers per school). Secondary vocational technical centers were numbered from 1 to 32, and the 12 schools were selected using the random number generation in Microsoft Excel.

Cluster sampling is appropriate to use in educational settings when it is impossible to select a random sample of individuals (Fraenkel & Wallen, 1996).

However, the disadvantage of cluster sampling is that each stage of the process increases sampling error.

Instrumentation

The five-part survey used in this study was adapted from a survey used in a similar investigation conducted by Kershaw (1993). A 5-point Likert-type scale was used throughout the instrument except for the measurement of attitudes toward assessment. Muller (1986) stated that using a scale with a middle category seems to work as well as a scale without a middle category.

The use of assessment information was measured in part one. Teachers were asked to indicate the extent they used information from six types of assessment methods in addressing ten different instructional decisions. The six types of assessment methods used in this study were (1) objective paper and pencil items, (2) informal observations, (3) standardized test scores, (4) performance assessments, (5) portfolios, and (6) essay-type items. The 10 instructional decisions that were addressed were (1) planning instruction, (2) diagnosing student weaknesses, (3) monitoring student progress towards course objectives, (4) communicating student achievement with parents, (5) motivating students to learn, (6) evaluating the effectiveness of instruction, (7) evaluating instructional materials used, (8) grouping students for instructional activities, (9) encouraging students to assess their own work, and (10) assigning grades. The following Likert scale was used: 1 = of no use; 2 = of limited use; 3 = of some use; 4 = of much use; 5 = of considerable use.

Part two was designed to measure participants' perceived level of competence in the assessment process. Competency statements were based upon "Standards for Teachers, National Council on Measurement in Education, and National Education Association, 1990). The following Likert scale was used: 1 = not competent; 2 = slightly competent; 3 = moderately competent; 4 = very competent; 5 = extremely competent.

Participants' attitudes toward assessment was measured in the third part of the instrument using a semantic differential scale. The scale consisted of nine bipolar adjectives (worthless – valuable, unsuccessful – successful, inefficient – efficient, unimportant – important, bad – good, unfair – fair, disreputable – reputable, rigid – flexible, and tense – relaxed) that represented various assessment -related concepts. A 7-point scale was used for each pair of adjectives. The scale was as follows: 1 = extremely negative; 2 = very negative; 3 = negative; 4 = neutral; 5 = positive; 6 = very positive; 7 = extremely positive. Respondents were asked to place a check mark between the adjectives at the point that best indicated how they would describe their attitude towards the overall assessment process.

In part four of the questionnaire, nine statements were used to measure teacher's perceptions of constraints to their assessment activities. Major constraints identified in the literature included: time, money, technology and assistance, training, autonomy in making assessment-related decisions, and availability of assessment materials. The 5-point Likert scale used in this section ranged from strongly disagree to strongly agree. Participants were asked to indicate their level of agreement with each of the constraint statements. Part five of the instrument consisted of demographic questions.

To ensure validity of the instrument, a panel of experts was used to establish content and face validity. The panel consisted of three vocational education teachers, a regional teacher educator, and two professors of vocational education. The instrument was field-tested for reliability with a sample of vocational education teachers ($\underline{n} = 11$) not selected for participation in the study. Changes indicated by the validation panel and field test were made. Internal consistencies for the scales in the instrument were as follows (Cronbach's Alpha): Use of Assessment .94, Competency in Assessment .93, Attitudes Toward Assessment .95, and Constraints in Assessment .64, acceptable according to Nunnally and Bernstein (1994).

Data Collection

The Total Design Method (TDM) of conducting surveys (Dillman, 1978) was followed in all stages of the questionnaire construction and implementation process. A packet containing a cover letter, instructions for administering the questionnaire, and copies of the questionnaire were mailed to the principal of each school selected for the study. A total of 240 questionnaires was sent to 12 principals during October, 1997. A total of 144 usable questionnaires was returned for a response rate of 60%. Because a number of questionnaires were returned uncompleted and there was no way to conduct appropriate follow-up procedures to control for non-response, the results of the study can only be generalized to the 144 teachers who provided usable data.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS Version 6.1 for Windows). Descriptive statistics were used to summarize the data. Multiple regression analyses were used to determine the variance in the use of assessment information as explained by selected independent variables. An alpha level of .05 was set a priori for the study.

Results

Demographic Characteristics

The largest number of teachers in the sample fell within the 42-51 year age bracket (52.1%) of the 144 cases, 56% of the respondents were male and 44% were female. Teachers had an average of 15.02 years of teaching experience and 9.66 years of related work experience. Trade and Industrial Education teachers comprised the largest group in the sample and accounted for 43% of the cases. A graduate degree had been earned by 39% of the respondents. Respondents who had completed a teacher preparation program on the job, and before receiving a bachelor degree, comprised 43% of the cases (see Table 1).

Use of Assessment Information

Table 2 depicts teachers' use of assessment information and educational decision making. Information generated from performance assessment was considered to be of more use to teachers in addressing educational decisions than any of the other assessment

methods (M = 4 .19). Teachers rated performance assessment information to be of much use (M = 4 .45) when specifically addressing the task of assigning grades.

Teachers reported that information derived from informal observations (M =3 .96) was of more use than all other assessment methods except performance assessment. Informal observations provided information that was considered by teachers to be of much use (M = 3 .80 - 4 .46) when addressing all 10 decision areas.

Information obtained from objective paper and pencil items (M = 3 .91) were found to be of less use than both performance assessments and informal observations, but of more use than essay items, portfolios, and standardized test scores. Information from this assessment method was found to be of much use (M = 3 .68 - 4 .14) for nine of the decision areas. Teachers revealed that objective and paper pencil items were of some use when grouping students for instructional activities.

Portfolio assessment, as defined by Vavrus, (1990) is a systematic and organized collection of evidence used by the teacher and student to monitor growth of the student's knowledge, skills, and attitudes in a specific subject area. It is a collection of student work which reflects student achievements over time. A portfolio contains documentation of not only the products that are generated by the student but also the processes that are involved. It might contain drawings, written documents, tests, notes, photographs, or comments from teachers and peers.

Portfolios were found to be of only some use (M = 2 .81) in providing information in the overall decision making process. However, teachers found portfolios to be of some use (M = 3 .02) when specifically communicating student achievement with parents.

Standardized test scores (M = 2 .75) and essay-type information (M = 2 .72) were the two assessment methods found to be of less importance to teachers when compared to the other methods. Teachers reported that standardized test scores were of some use when evaluating the effectiveness of their teaching methods (M = 3 .03) and of limited use (M = 2 .37) when assigning grades. For addressing educational decisions, information obtained through the implementation of essay type methods were found to be of some use for all ten decision areas (M= 2 .50 - 2 .84).

Insert Table 2 about here

Perceived Level of Competency in Assessment

Table 3 provides information regarding teachers' perceived level of competence in individual assessment activities. Teachers considered themselves to be very competent (M = 4 .35 - 3 .52) in all but three areas of the assessment process. Teachers perceived themselves to be only moderately competent when interpreting the scores of standardized achievement tests (M = 3 .24), scoring an essay (M = 3 .36), and compiling a student portfolio (M = 3 .38).

Insert Table 3 about here

Attitudes Toward Asessment

A semantic differential scale was used to measure teachers' attitudes toward the overall assessment process. Teachers were asked to respond to nine pairs of bipolar adjectives which were on either end of a 7-point scale. Respondents reported that they perceived the assessment process to be valuable, efficient, and important (M = 5 .77 to 5 .40). The assessment process was perceived as less positive in terms of being fair, good, reputable, successful, flexible, and relaxed (M = 5 .37 to 4 .46).

Constraints to the Assessment Process

Table 4 describes the responses to each of the constraint questions. Teachers tended to agree that they decided on what assessment methods to use in their courses (M = 4 .28). Teachers also tended to agree that additional planning time would allow for assessment methods to be used more effectively (M = 3 .94). Over two-thirds of the items were rated as "neutral" by respondents in this study (M = 2 .69 - 3 .00).

Insert Table 4 about here

Multiple Regression Models

Table 5 reveals that 15% (R^2 = .154) of the variance in the use of objective paper and pencil assessment methods was due to the combined linear effects of the independent variables. Two variables: "competence in assessment" and "attitudes toward assessment" were shown to be significant contributors of objective paper and pencil assessment methods.

Insert Table 5 about here

The regression of the use of standardized test scores on selected independent variables revealed that the proportion of variance explained was 0.1% (R^2 .001). This model was statistically not significant ($p > .05$).

The third statistical model regressed the dependent variable, use of performance assessment, on selected independent variables. The independent variables accounted for 21% of the variance. Attitude, constraints, gender, and certification were significant contributors of the use in performance assessment. (see Table 6).

Insert Table 6 about here

Table 7 summarizes the regression of the use of the informal observations on selected independent variables. It was found that attitudes toward assessment, competence in assessment, and certification were significant contributors in the use of informal observations. The model was statistically significant ($F = 3$ .768).

Insert Table 7 about here

The regression of the dependent variable, use of portfolios, on selected independent variables revealed that the proportion of variance (R^2 .086) explained was

statistically not significant ($p > .05$). Table 8 shows the regression model for essay-type items. Only competence and certification combine to be significant contributors of essay-type items. This model was statistically significant ($F = 2.33$).

Insert Table 8 about here

Conclusions

The results of this study cannot be generalized beyond the respondents to this survey. The typical secondary vocational education teacher

- is more likely to be in the age bracket of 42-51 years old;
- completed an average of 15 years of teaching and 10 years of related work experience,
- completed a graduate degree,
- completed a teacher preparation program on the job; and
- is more likely to be a teacher in trade and industrial education.

Some of these findings are partially explained in a study done by Lynch (1993). According to Lynch's study (1993), secondary vocational education teachers tend to have less formal education than others, but they have more related occupational experience and credentials. This emphasis on occupational experience in lieu of formal education is concentrated in trade and industrial education, where it has been guided by state policies in a tradition going back to back to Smith-Hughes Act of 1917.

Teachers rated information provided from performance assessments as being of more use in addressing daily classroom decisions (example, when specifically addressing the task of assigning grades) than information obtained from the other five methods. This finding suggests that performance assessments are particularly useful to vocational educators because they can be used to stimulate real occupational settings. This finding is supported by a study done by Kershaw (1993). According to Kershaw's study, secondary vocational education teachers in Ohio were more likely to use performance assessments than any other methods.

Attitudes toward assessment were viewed as being positive by secondary vocational education teachers. Teachers with more positive attitudes toward assessment and with higher levels of competence in assessment tended to use performance assessments more than teachers with less positive attitudes and weaker levels of competence in assessment. Scharfer and Lissitz (1987) concluded that although teachers may be ill-trained to use accepted measurement practices, they see assessment as an important part of their professional role and feel positively toward it.

There appeared to be little practical variance explained with essay items, portfolios, and standardized tests in the use of assessment methods. Demographic and background characteristics accounted for no significant variation in teachers' use of assessment methods. These findings are in agreement with a study done by Kershaw (1993). However, this study contradicts findings by Ryans (1960); Yeh, Herman, and Rudner (1981). Ryans (1960) found significant differences in teacher's classroom behavior due to variables such as age, and teaching experience. Yeh, et al. (1981)

reported that years of teaching experience was found to be related to different patterns of assessment.

Implications

To select an appropriate assessment a teacher must know how the information elicited from it will be used, since high stakes assessments used for placement decisions require much more rigor in their development to ensure high reliability and validity than do assessments used for low stakes purposes. Assessments designed to give students feedback for developmental purposes do not have to meet the same level of statistical or psychometric rigor that decision-making assessments do. Thus, any of the assessment types described in this study can be used effectively in the classroom for low stakes or medium stakes purposes. Teachers have considerable latitude in how they assess students' knowledge and skills, but they need to think about how assessment can contribute to students' learning about themselves, particularly in relationship to skills needed in the workplace.

The moderate levels of perceived assessment competence as documented in this study, the small but significant influence with the use of assessment methods, along with research which has identified the deficiencies of teacher assessment skills, suggest the potential necessity or the upgrading of secondary vocational education teacher competence in assessment practices.

To make changes that are conceptually meaningful, secondary vocational education teachers need: appropriate materials to try out and adapt; time to reflect and to

develop new instructional approaches, and ongoing support from experts to learn (and challenge) the conceptually bases behind intended reforms.

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Table 1.

Categorical Demographic Information (n = 144)

Variable of Interest	Frequency	Percent
Gender:		
Male	81	56
Female	63	44
Age :		
22-31	4	2.8
32-41	31	21.5
42-51	75	52.1
52-62	32	22.2
63 and above	2	1.4
Years of Teaching Experience:		
0-10	55	38.20
11-21	49	34.02
22-23	38	26.39
33	2	1.39
Years of Related Work Experience:		
0-5	50	34.72
6-11	4	31.94
12-17	24	16.66
18-23	11	7.63
24-29	9	6.25
30	4	2.80
Vocational Education Program Areas:		
Agriculture	6	4.2
Business Occupations	13	9.0
Health Occupations	14	9.7
Family and Consumer Sciences	9	6.2
Marketing	1	0.7
Trade and Industrial	62	43.1
Other Related Areas	39	27.1

(table continues)

Table 1 continued

Variable of Interest	Frequency	Percent
Highest Educational Level:		
High School Diploma	1	0.7
Some College	30	20.8
Associate Degree	10	6.9
Bachelor's Degree	47	32.6
Master's Degree	56	39.0
Certification Route:		
Teacher preparation program completed prior to teaching	59	41
Teacher preparation program completed after entering teaching and before receiving a degree	62	43
Teacher preparation program completed after entering and teaching and after receiving a degree	23	16

Table 2.

Means[a] and Standard Deviations for the Use of Assessment Information Generated From Six Assessment Methods (n =144)

Decision Area	Objective Item		Standardized Test Score		Performance Assessment		Informal Observation		Portfolio		Essay Item	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1.	4.00	1.01	2.84	1.13	4.24	.82	4.09	.87	2.68	1.17	2.81	1.17
2.	3.96	.99	3.02	1.17	4.20	.93	4.16	.86	2.73	1.24	2.84	1.18
3.	4.13	.92	2.72	1.19	4.27	.89	4.00	.95	2.78	1.23	2.81	1.10
4.	3.89	1.15	2.83	1.27	4.03	1.02	3.80	1.09	3.02	1.35	2.72	1.20
5.	3.70	1.12	2.62	1.10	4.27	.83	4.00	.97	2.85	1.25	2.61	1.09
6	4.14	1.05	3.03	1.29	4.36	.78	4.06	.90	2.89	1.28	2.82	1.30
7	3.90	1.03	2.85	1.20	4.06	.91	3.84	1.02	2.79	1.21	2.72	1.15
8	3.49	1.18	2.67	1.22	3.93	1.10	3.95	1.12	2.62	1.24	2.50	1.18
9	3.68	1.23	2.60	1.23	4.16	.97	3.80	1.13	2.97	1.30	2.60	1.27
10	4.27	.97	2.37	1.36	4.45	.86	3.97	1.03	2.78	1.36	2.77	1.27
Overall Means	3.91		2.75		4.19		3.96		2.81		2.72	

Note. Educational Decision Areas:
1. Plan for instruction.
2. Diagnose student weakness.
3. Monitor student progress.
4. Communicate student achievement.
5. Motivate students.
6. Evaluate instruction.
7. Evaluate instructional materials
8. Group students.
9. Encourage self-assessment.
10. Assign grades.

[a] Based on scale: 1 = of no use; 2 = of limited use; 3 = of some use; 4 = of much use; 5 = of considerable use.

Table 3.

Means[a] and Standard Deviations for Teachers Perceived Competence in the Assessment Process (n = 144)[b]

Characteristics	M	SD
Grade objective paper and pencil items	4.35	.76
Score a performance assessment	4.14	.82
Prepare students to take tests	4.12	.74
Administer a performance assessment	4.11	.85
Communicate assessment result to students	4.07	.85
Develop student grading procedures	4.06	.86
Select methods for assessing student performance	4.05	.79
Match items to intended learning outcomes	4.03	.83
Select assessment methods for monitoring student learning	3.93	.76
Communicate assessment result to employers	3.84	.84
Use assessment results to monitor student learning	3.83	.90
Recognize unethical methods of using assessment	3.80	1.04
Determine proper difficulty of items	3.78	.89
Develop a performance assessment rating scale	3.73	.90
Identify the weakness of assessment methods	3.73	.74
Use assessment results to organize a sound instructional plan	3.73	.93
Write directions for assessment methods	3.72	.94
Analyze the validity of test items	3.70	.90
Select a representative sample of items to use for assessment purposes	3 .70	.90
Communicate assessment results to parents	3 .67	1.03
Determine appropriate number of items of assessment method	3 .67	.86
Identify structural problems in objective questions	3 .62	.84
Examine items for gender bias	3 .52	1.00
Compile a student portfolio	3 .38	1.15
Score an essay	3 .36	1.05
Interpret the scores of standardized achievement tests	3 .24	1.16

Note. [a] Based on scale : 1= not competent; 2 = slightly competent; 3 = moderately competent; 4 = very competent; 5 = extremely competent.
[b] Three missing cases.

Table 4.

Means[a] and Standard Deviations for Teacher Perceptions of Constraints to the Assessment Process (n = 144)

Item	M	SD
I decide what assessment methods to use in courses I teach	4 .28	.97
Additional planning time would allow me to use assessment methods more effectively	3 .94	1 .10
Equipment is available in my school for use in scoring tests	3 .06	1 .41
Quality published assessment materials are hard to find	3 .00	1 .18
Funds are available for buying published assessment materials	2 .91	1 .32
College courses were of little help in preparing me to assess student learning	2 .86	1 .25
In-service activities have helped develop my assessment skills	2 .81	1 .15
I have assistance in preparing student assessment activities	2 .75	1 .37
I do not have information on published assessment materials	2 .69	1 .20

Note. [a] Based on scale: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree.

Table 5.

Multiple Regression Analysis for Use of Objective Paper and Pencil Assessment Methods on Selected Variables (n = 144)[a]

Variable	Standardized Beta Coefficients	t	Sig.
Attitude	.235	2.698	.007*
Constraints	.101	1.233	.219
Competence	.248	2.847	.005*
Gender	.045	.514	.607
Age	– .023	– .216	.829
Years of Teaching Exp.	– .179	– 1.639	.103
Years of Related Work Exp.	– .185	– 1.849	.066
Type of Program	– .063	– .771	.442
Educational Level	.022	.232	.816
Certification Route	.056	.612	.541

Note. Multiple correlation coefficient (R) = .463.
Adjusted R^2 ("epsilon-squared") = .154.
For Model: F = 3.558.
* $p < .05$.
Dependent Variable: objective paper and pencil assessment methods.
[a] Three missing cases.

Table 6.

Multiple Regression Analysis for Use of Performance Assessment on Selected variables (n = 144)[a]

Variable	Standardized Beta Coefficients	t	Sig.
Attitude	.370	4.394	.000*
Constraints	.169	2.143	.034*
Competence	.134	1.598	.112
Gender	.172	2.024	.045*
Age	.005	.056	.955
Years of Teaching Exp.	−.133	−1.266	.207
Years of Related Work Exp.	−.073	− .761	.447
Type of Program	−.075	− .959	.339
Educational Level	.050	.544	.587
Certification Route	.181	2.053	.042*

Note. Multiple correlation coefficient (R) = .518.
Adjusted R^2 ("epsilon-squared") = .213.
For Model: F = 4.790.
* $p < .05$.
Dependent Variable: performance assessment.
[a] Three missing cases.

Table 7.

Multiple Regression Analysis for Use of Informal Observations on Selected Variables

($n = 144$)[a]

Variable	Standardized Beta Coefficients	t	Sig.
Attitude	.257	2.966	.003*
Constraints	.067	.835	.405
Competence	.213	2.467	.014*
Gender	.166	1.896	.060
Age	−.101	−.949	.344
Years of Teaching Exp.	.028	.263	.793
Years of Related Work Exp.	.001	.019	.985
Type of Program	−.102	−1.255	.211
Educational Level	.137	1.431	.155
Certification Route	.184	2.029	.044*

Note. Multiple correlation coefficient (R) = .474.
Adjusted R^2 ("epsilon-squared") = .165.
For Model: $F = 3.768$.
* $p < .05$.
Dependent Variable: informal observations.
[a] Three missing cases.

Table 8.

Multiple Regression Analysis for Use of Essay Items on Selected Variables

(n = 144)[a]

Variable	Standardized Beta Coefficients	t	Sig.
Attitude	−.025	−.282	.778
Constraints	.083	.981	.328
Competence	.267	2.951	.003*
Gender	−.098	−1.076	.283
Age	.027	.247	.805
Years of Teaching Exp.	−.165	−1.452	.148
Years of Related Work Exp.	−.042	− .403	.687
Type of Program	−.110	−1.301	.195
Educational Level	.081	.809	.420
Certification Route	.196	2.064	.041*

Note. Multiple correlation coefficient (R) = .390.
Adjusted R^2 ("epsilon-squared") = .086.
For Model: F = 2.33.
* $p < .05$.
Dependent Variable: essay items.
[a] Three missing cases.

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