

Evaluation of the Veterinary Technician National Examination

This evaluation was conducted by the
Office of Professional Examination Services (OPES)
for the Registered Veterinary Technician Committee

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July 12, 2010



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EVALUATION OF THE VETERINARY TECHNICIAN NATIONAL EXAMINATION

Purpose

Licensing boards, bureaus, and committees within the California Department of Consumer Affairs are required to ensure that examination programs being used in the California licensure process comply with psychometric and legal standards.

The Registered Veterinary Technician Committee (Committee) contracted with the Department of Consumer Affairs' Office of Professional Examination Services (OPES) to conduct two independent focus group workshops for the purpose of evaluating the Veterinary Technician National Examination (National exam) to determine if it meets professional psychometric standards and content acceptable for California licensure.

Introduction

The American Association of Veterinary State Boards (National Association) contracts with Professional Examination Services (PES), a private company, to conduct their occupational analysis, ongoing examination development and administration services for the National exam. OPES, in collaboration with the Committee, requested documentation of the entire examination development process from the National Association to compare it with the current California examination development process. This documentation was gathered to determine whether the (a) occupational analysis¹, (b) examination development, (c) passing scores², (d) test administration, (e) examination performance, (f) information available to candidates, and (g) test security procedures meet professional guidelines and technical standards outlined in the Standards for Educational and Psychological Testing (APA Standards)³ and California Business and Professions (B&P) Code section 139.

Psychometric Standards and Findings

Prior to convening the focus group workshops, OPES used the following testing standards to evaluate the National exam according to the above seven criteria (a-g).

(a) Occupational Analysis – The most relevant Standard from the *APA Standards* relating to job analyses, as applied to credentialing or licensing examinations, is:

¹ An occupational analysis is also known as a job analysis, a practice analysis, or a task analysis.

² A passing score is also known as a pass point, cut score, or standard score.

³ American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, *Standards for Educational and Psychological Testing*, Washington, DC, American Educational Research Association, 1999.

Standard 14.14

The content domain to be covered by a credentialing test should be defined clearly and justified in terms of the importance of the content for credential-worthy performance in an occupation or profession. A rationale should be provided to support a claim that the knowledge or skills being assessed are required for credential-worthy performance in an occupation and are consistent with the purpose for which the licensing or certification program was instituted. (p. 161)

The comment following Standard 14.14 emphasizes its relevance:

Comment: Some form of job or practice analysis provides the primary basis for defining the content domain. If the same examination is used in the licensure or certification of people employed in a variety of settings and specialties, a number of different job settings may need to be analyzed. Although the job analysis techniques may be similar to those used in employment testing, the emphasis for licensure is limited appropriately to knowledge and skills necessary for effective practice... In tests used for licensure, skills that may be important to success but are not directly related to the purpose of licensure (e.g., protecting the public) should not be included. (p. 161)

Findings: PES conducted an occupational analysis in January 2007 for the National exam. The 2007 National exam occupational analysis has been documented in a report⁴ that OPES found to be consistent with professional guidelines and technical standards.

(b) Examination Development – The most relevant standards from the *APA Standards* relating to examination development, as applied to credentialing or licensing examinations, are:

Standard 3.6

The type of items, the response formats, scoring procedures, and test administration procedures should be selected based on the purposes of the test . . . The qualifications, relevant experiences, and demographic characteristics of expert judges should also be documented. (p. 44)

Standard 3.7

The procedures used to develop, review, and try out items, and to select items from the item pool should be documented. If the items were classified into different categories or subtests according to the test specifications, the procedures used for the classification and the appropriateness and accuracy of the classification should be documented. (p. 44)

⁴ Report of the Job Analysis of Veterinary Technicians – Confidential document 1 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

Standard 3.9

“When a test developer evaluates the psychometric properties of items, the classical or item response theory (IRT) model used for evaluating the psychometric properties of items should be documented. The sample used for estimating item properties should be described and should be of adequate size and diversity for the procedure. The process by which items are selected and the data used for item selection . . . should also be documented” (p. 44-45)

Standard 3.11

Test developers should document the extent to which the content domain of a test represents the defined domain and test specifications. (p. 45)

Findings: The information regarding the National examination development⁵ was obtained through direct correspondence with the National Association. OPES found that the criteria used to develop the National exam is consistent with professional guidelines and technical standards.

- (c) Passing Scores – The passing score of an examination is the score that represents the cut-off that divides those candidates for licensure who are minimally competent and those who are incompetent. The most relevant standards from the *APA Standards* relating to passing scores, points, cut scores, or standard scores as applied to credentialing or licensing examinations, are:

Standard 4.21

When cut scores defining pass-fail or proficiency categories are based on direct judgments about the adequacy of item or test performance or performance levels, the judgmental process should be designed so that judges can bring their knowledge and experience to bear in a reasonable way. (p. 60)

Standard 14.17

The level of performance required for passing a credentialing test should depend on the knowledge and skills necessary for acceptable performance in the occupation or profession and should not be adjusted to regulate the number or proportion of persons passing the test. (p. 162)

The supporting commentary on passing or cut scores in the *APA Standards*, Chapter 4 – Scales, Norms, and Score Comparability, states that there can be no single method for determining cut scores for all tests and all purposes. The process used should be clearly documented and defensible. The qualifications of the judges involved, and the process of selection should be part of the documentation. A sufficiently large and representative group of judges should be involved, and care must be taken to assure that judges understand what they are to do.

⁵ National exam development information – Confidential document 2 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

In addition, the supporting commentary in the *APA Standards*, Chapter 14 – Testing in Employment and Credentialing, states that the focus of credentialing standards is on “levels of knowledge and performance necessary for safe and appropriate practice” (p. 156). “Standards must be high enough to protect the public, as well as the practitioner, but not so high as to be unreasonably limiting.” (p. 157)

Findings: OPES found that the passing score process⁶ conducted by PES demonstrates a sufficient degree of validity, meeting professional guidelines and technical standards.

(d) Test administration - The most relevant standards from the *APA Standards* relating to test administration, as applied to credentialing or licensing examinations, are:

Standard 5.1

Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer, unless the situation or a test taker’s disability dictates that an exception should be made. (p. 63)

Standard 5.2

Modifications or disruptions of standardized test administration procedures or scoring should be documented. (p. 63)

Standard 5.5

Instructions to test takers should clearly indicate how to make responses. Instructions should also be given in the use of any equipment likely to be unfamiliar to test takers. Opportunity to practice responding should be given when equipment is involved, unless use of the equipment is being assessed. (p. 63)

Findings: OPES found that the test administration protocols⁷ in place by the National Association appear to meet professional guidelines and technical standards.

(e) Examination Performance - The most relevant standards from the *APA Standards* relating to examination performance, as applied to credentialing or licensing examinations, are:

Standard 2.1

For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant reliabilities and standard errors of measurement or test information functions should be reported. (p. 31)

⁶ National passing score development - Confidential document 2 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

⁷ National test administration information - Confidential document 2 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

Standard 3.9

When a test developer evaluates the psychometric properties of items, the classical or item response theory (IRT) model used for evaluating the psychometric properties of items should be documented. The sample used for estimating item properties should be described and should be of adequate size and diversity for the procedure. The process by which items are selected and the data used for item selection, such as item difficulty, item discrimination, and/or item information, should also be documented. When IRT is used to estimate item parameters in test development, the item response model, estimation procedures, and evidence of model fit should be documented. (pp. 44-45)

Findings: OPES found that the steps taken by the National Association to evaluate examination performance⁸ are valid and legally defensible, meeting professional guidelines and technical standards.

- (f) Information available to candidates - The most relevant standards from the *APA Standards* relating to candidate information, as applied to credentialing or licensing examinations, are:

Standard 8.1

Any information about test content and purposes that is available to any test taker prior to testing should be available to *all* test takers. Important information should be available free of charge and in accessible formats. (p. 86)

Standard 8.2

Where appropriate, test takers should be provided, in advance, as much information about the test, the testing process, the intended test use, test scoring criteria, testing policy, and confidentiality protection as is consistent with valid responses. (p. 86)

Findings: The National Association Web site is located at www.aavsb.org. It provides extensive information about the National exam as a central resource for information. OPES found that the information provided to candidates about the National exam is comprehensive, meeting professional guidelines.

- (g) Test Security - The most relevant standards from the *APA Standards* relating to test security, as applied to credentialing or licensing examinations, are:

Standard 5.6

Reasonable efforts should be made to assure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent means. (p. 64)

⁸ National exam performance information - Confidential document 2 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

Standard 5.7

Test users have the responsibility of protecting the security of test materials at all times. (p. 64)

Findings: OPES found that the policies and procedures used for test security⁹ meet professional guidelines and technical standards.

Workshop Participants

The Committee convened two workshops that consisted of independent panels of California licensees representing diverse geographic locations and years of experience serving as subject matter experts (SMEs). The first workshop was conducted on March 25-26, 2010 by two OPES facilitators. The group consisted of nine SMEs; two were Doctors of Veterinary Medicine (DVMs), and seven were Registered Veterinary Technicians (RVTs). The second workshop was conducted on April 29-30, 2010 by the same OPES facilitators. The group consisted of eight SMEs; two were DVMs and six were RVTs.

Workshop Process and Results

The two workshops were conducted independently of one another, held at different times with different SMEs, and were jointly facilitated by two OPES testing specialists. The materials, the process and the procedures were the same for both the workshops.

Both the workshops began by having the SMEs complete OPES' licensure examination security agreement, self-certification, secure area agreement, and personal data (demographic) forms. The OPES facilitators explained the importance of and guidelines for the security and confidentiality of materials and information both during and outside the workshop. The SMEs were then asked to identify and introduce themselves to the facilitators and the group.

The OPES facilitators explained the goals of the workshops, which were to explain the psychometric standards and findings, determine if the National exam is acceptable for California licensure, and make recommendations to the Committee for future licensure examinations based on OPES findings and workshop results.

Both groups of SMEs were presented with an explanation regarding the purpose and importance of an occupational analysis, examination development process, validity, content validation, reliability, and psychometric standards. These topics were discussed in detail to ensure the SMEs understood these concepts and their importance to the process.

⁹ National test security information - Confidential document 2 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

An occupational analysis based on task and knowledge statements typically includes a survey distributed to the licensees of the profession to determine the specifications of an examination plan (content domains and content weightings) for that profession. The two groups were presented with the occupational analysis respondent demographics¹⁰ information in the form of a comparison table. The groups independently compared the 2007 National survey demographics with the 2004 California survey demographics. All nine SMEs from the first workshop, as well as the eight SMEs from the second workshop, agreed that the respondent demographics comparison was sufficiently equivalent in respondent years of licensure, number of hours worked, and type of animal practice to be deemed the same.

Both groups were then presented with the 2007 National and the 2004 California (CA) examination plan or test specifications¹¹ in the form of a comparison table. The group compared content domain categories, their respective examination weightings, and the total number of test questions. The examination plan categories, ratings, and total number of test questions were determined to be sufficiently equivalent.

Both groups were then asked to compare the tasks and knowledges of the National examination plan¹² with the CA examination plan. The level of specificity (the amount of detail) was significantly different in the two examination plans. The CA examination plan task and knowledge statements were written in much greater detail compared to the broader scope task and knowledges in the National examination plan. Therefore, to determine if the National examination covered the same content as the CA examination, the SMEs were asked if they could link each CA task to a task and knowledge that covered the same content as in the National examination plan. The first half of the CA tasks were linked in the first workshop and the second half of the CA tasks were linked in the second workshop. By the time each group completed their assigned task linkage, they were familiar with the examination plan and were asked to identify any remaining tasks they believed did not link to the National. The combined effort of both workshops officially linked each CA task with the exception of those pertaining to CA law and regulations.

Both groups reviewed the California B&P and California Code of Regulations (CCR) codes relating to the CA RVT scope of practice and licensure qualifications. Both groups of SMEs were told that the purpose of reviewing these documents was to obtain an understanding of California's examination requirements, and to use this information when assessing the National examination specifications.

¹⁰ Respondent Demographics Table – Confidential document 3 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

¹¹ Test Specifications Table – Confidential document 4 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

¹² National Exam Plan - Confidential document 5 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

After linking each CA task and knowledge statement to the National exam plan, all nine SMEs from the first workshop, as well as the eight SMEs from the second workshop, found the exam plans to be sufficiently equivalent to be acceptable for California licensure except for law and regulations. The results of the SME's linkage indicated that the competencies assessed in the National exam are relevant to veterinary technician practice in California with the exception of task and knowledge statements related to California laws and regulations.

National and California licensure candidates are provided with a candidate handbook at the time they register to take the licensing examination. The National handbook is available on the National Association Web site located at www.aavsb.org. Both groups of SMEs were asked to review the National and the CA candidate handbooks. The SMEs were asked to take the sample test from both the handbooks. The purpose of taking the test was two-fold; to evaluate the type of questions on the exams and to look at the quality of test questions on the exam. After reviewing the National and the CA handbooks, both groups found the National handbook to be acceptable.

The SMEs then discussed the National exam development procedures, SME selection criteria, exam reviewers, test administration procedures, scoring procedures that included establishment of passing scores, and test security procedures at length. All SMEs found these procedures and criteria acceptable.

The group then reviewed the examination statistics¹³ including passing score data for two administrations of the National exam (based on the 2007 National exam plan) and the CA exams (based on the 2004 exam plans) in the form of a comparison table. This included information regarding the total number of candidates taking the examinations, total number of questions on the examinations, candidate mean score, standard deviation, range of raw scores, reliability, standard error of measurement and the passing rates. Both groups of SMEs agreed that the examination statistics were sufficiently equivalent to be acceptable for California licensure.

Conclusions and Recommendations

OPES completed a comprehensive analysis and evaluation of the National examination related documents provided by National Association; specifically; the current (a) occupational analysis, (b) examination development, (c) passing scores, (d) test administration, (e) examination performance, (f) information available to candidates, and (g) test security procedures. OPES found that the procedures used to establish and support the validity and defensibility of the National exam components listed above meet professional guidelines and technical standards outlined in the *Standards for Educational and Psychological Testing (APA Standards)* and B&P Code section 139.

¹³ Examination Statistics Table - Confidential document 6 is held at OPES according to a confidentiality agreement signed between the National Association, California Veterinary Medical Board, and OPES.

Both groups of SMEs unanimously agreed that the occupational analysis survey respondent demographics, exam development procedures, SME selection criteria, test administration procedures, scoring procedures that included establishment of passing scores, and test security procedures comparisons were sufficiently equivalent. The results of the SME's linkage indicated that the competencies assessed in the National exams are relevant and comprehensive to veterinary technician practice in California with the exception of task and knowledge statements related to California laws and regulations.

All SMEs from both groups were unanimous in their recommendation to the Committee to accept the National exam for California licensure, but only under the condition that a supplemental examination of RVT-related California Law and Regulations be administered to each candidate for licensure.