National Athletic Trainers' Association Board of Certification, Inc.

Annual Report for the 1999 Testing Year
Columbia Assessment Services, Inc.
Research Triangle Park, NC
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The National Athletic Trainers Association Board of Certification, Inc. (NATABOC) offers the designation Certified Athletic Trainer (ATC) for individuals who meet clearly defined criteria. This designation protects the public by establishing and evaluating individual compliance with entry-level standards for the athletic training profession. Only the athletic trainers who submit the required documentation of coursework; have experience requirements that separate candidates for certification according to whether they have completed an approved curriculum or an internship program; possess the necessary qualifications; and pass NATABOC's three-part criterion-referenced examination consisting of a written multiple-choice test, a written simulation, and a practical test can call themselves Certified Athletic Trainers (ATC). Throughout the United States, many employers require that athletic trainers possess the ATC.

The value of the credential rests in large measure on the quality of the NATABOC examination. Accordingly, NATABOC works with Columbia Assessment Services, Inc., (CAS), a professional testing service specializing in certification and licensure examinations, to ensure that all guidelines and standards pertaining to the examination are fully satisfied. NATABOC conducted two significant projects to maintain the quality of the examination in 1999: the second phase of a new role delineation study and a comprehensive examiner training program. NATABOC monitors the performance of the examination regularly to ensure its function at the highest possible level of quality.

Role Delineation Study

Fundamental among the qualities of a certification examination is the concept of validity. Validity refers to the ability of the examination to achieve the purpose for which it is intended. In order to argue successfully that an examination is valid, there must be studies and other accumulated evidence documenting that the examination accomplishes its intended purpose. For the NATABOC examination, it is essential to demonstrate content validity, meaning that there is evidence that the test accurately assesses job-related knowledge, skill, and other abilities in a manner that is faithful to the practice of athletic training.

The primary means of ensuring content validity is to conduct a periodic analysis of the profession. The method NATABOC uses is referred to as role delineation study. In role delineation studies, the focus of analysis is the role played by the professional in providing care to those who require it. Because changes occur in professions with the introduction of new research and technology, it is important to conduct role delineation studies periodically so the definition of practice to which the examination is linked is current and accurate. NATABOC has conducted role delineation studies regularly since establishing the certification program for athletic trainers, with the previous report published in 1994.

The current role delineation study progressed on schedule in 1999 with the conclusion of the second phase of the role delineation project. CAS conducted a psychometric and editorial review of the statements of knowledge, skills, and abilities provided from the first phase of the role delineation project, and prepared a 13-page questionnaire for a pilot study based on the domains and tasks developed by the Role Delineation Panel. The pilot study questionnaire was distributed in January 1999, to a national

random sample of 200 practicing athletic trainers. The sample was asked to evaluate, validate, and provide feedback on the domains and tasks developed by the panel. CAS conducted a comprehensive analysis of pilot study data and made recommendations to NATABOC concerning the manner in which data might be collected on a small number of survey items.

CAS then revised the questionnaire based on pilot study data and the decisions made by NATABOC, and distributed the questionnaire to a randomly selected national sample of 2000 athletic trainers, along with a cover letter from NATABOC and one from CAS. The data for the national validation study was collected in March and April 1999. CAS received 716 usable responses during this time, for a return rate of 36%, which is quite high, given the length and time required to complete the unsolicited questionnaire. CAS compiled and analyzed the questionnaire results to determine whether the survey respondents' views of the athletic training profession were consistent with those of the panel of experts. CAS then compared the responses of specific subgroups with the responses of all survey participants. Some of the subgroups included route of entry to certification, level of education, years of experience, geographic region, and primary job responsibility. These analyses determined whether or not a subgroup had a markedly different view of the profession from that of the overall group of respondents.

Using the validation data collected from the survey, CAS determined the test specifications by converting into percentages the importance, criticality, and frequency ratings for each domain and task. CAS also evaluated the knowledge, skills, and abilities to determine the most appropriate testing format(s) for assessing professional competence.

Examiner Training Program

The practical portion of the NATABOC certification process requires candidates to perform various hands-on procedures as a sample of the many tests and techniques that athletic trainers use on the job. The scoring of the practical portion of the examination is based on the live performance of the candidate as recorded by trained observers, or examiners. In order to ensure that examiners record their observations of candidate performance as accurately as possible, and in accordance with NATABOC standards, NATABOC developed a comprehensive training program in 1998. Beginning in April 1999, all examiners were required to pass the examiner training program before they were allowed to score any candidate’s performance.

Since the implementation of the examiner training program in April 1999, reliability among examiners scores has shown a positive increase. The inter-rater reliability percentage of agreement, a statistic measured on a scale of 0 to 1 with .70 meeting minimal standards has increased from an average reliability of .79 in 1998 to an average reliability of .89 in 1999. This program, which replaced an earlier examiner-training program used on previous formats of the practical examination, improved upon the practical examination process in only one year.

Performance of Certification Examination

NATABOC's certification examination contains three parts, a written multiple-choice test, a written simulation, and a practical test. Candidates must pass all three parts in order to achieve certification. After qualifying to take the examination by completing an approved course of study (curriculum candidacy) or a required sequence of courses and an internship (internship candidacy), first-time candidates take all three portions on the same test date. If they are unsuccessful on any part, candidates can register only for the part(s) not yet satisfied. Each testing year (which begins with the April test administration and extends through the February test administration), NATABOC introduces two new versions of the written multiple-choice test, two new versions of the written simulation test, and four new versions of the practical test.

Reliability

Reliability computation for the NATABOC examination is an estimate of the consistency of the scores as a measure of competence in athletic training. While NATABOC computes reliability coefficients for each form and test date, the following report is based on the annual statistics for each form and part of the examination. Internal consistency reliability is reported as the Kuder Richardson [KR(20)] coefficient and accounts for the degree to which items on the tests contribute consistently to candidates' scores. The KR(20) statistic ranges from 0 to 1, with coefficients above .70 meeting minimum standards. The standard error of measurement is the range within which candidates' true scores lie.

Table I. Internal Consistency, Standard Error of Measurement (S.E.M.), and Decision Consistency*

	Written		Practical				Simulation	
Form	274	275	276	277	278	279	280	281
Reliability KR20	.81	.78	.96	.95	.95	.97	.95	.95
Inter-rater Rel. % Agreement			.87	.90	.88	.89		
Inter-rater Rel. Pearson's ?			.88	.89 .	.87	.90		
S.E.M.	5.13	5.07	1.28	1.33	1.42	1.18	22.36	22.36
Decision Consistency	.82	.78	.96	.95	.94	.97	.95	.95

**Reliability scores are reported as coefficients based on scaled scores*

Since the purpose of the certification is to make valid and reliable pass/fail decisions, NATABOC also calculates decision consistency estimates using the Livingston formulation. The result of this analysis indicates that the classification of candidates in pass/fail categories exhibits reasonable consistency for all parts of the test. (The decision consistency coefficient is interpreted in a manner comparable to internal consistency.)

The accuracy of scores on the practical portion of the examination is a function of the inter-rater reliability. Examiners observe candidate performance on the practical examination and, using the scoring criteria defined for each problem, record whether or not the candidate performs required tasks at a level that is at least minimally competent. Inter-rater reliability is the measure of agreement between the examiners. A high level of agreement indicates that the scores are highly accurate.

How Candidates Perform on the Certification Examination

During the 1999 testing year, a total of 4592 candidates (including both first-time candidates and those retaking parts of the examination) took the written multiple-choice part of the NATABOC examination. In addition, a total of 4276 candidates (including both first-time candidates and those retaking parts of the examination) took the practical part of the NATABOC examination, and 4181 candidates (including both first-time candidates and those retaking parts of the examination) took the written simulation part of the NATABOC examination.

A total of 31.26 % of the candidates (curriculum and internships combined) passed all three parts of the examination on the first attempt. 25.80% of internship route candidates passed all three part of the examination on the first attempt and 38.86% of curriculum route candidates. The performance of the total group of candidates is presented in Table II. Given that the various forms are equivalent, the data below are presented across forms.

Table II. All Candidates Taking the Examination

	Total Sitting	# Pass	% Pass	# Fail	% Fail
Written	4592	2277	49.59 %	2315	50.41 %
Practical	4276	2316	54.16 %	1960	45.84 %
Simulation	4181	2266	54.20 %	1915	45.80 %

For those candidates who are taking the test for the first time, it is required that they take all three parts of the test on the same test date. Before taking the examination, they must meet eligibility requirements as curriculum or internship candidates. In following table (Table III), the analysis of first-time candidates is shown according to their route to eligibility.

Table III. Candidates Taking the Examination for the First Time

	Total Sitting	Total Pass / %	Total Fail / %	Total Intern	# Intern Pass / %	# Intern Fail / %	Total Curr	# Curr Pass / %	# Curr Fail / %
Written	2572	1566 60.89	1006 39.11	1517	819 53.99	698 46.01	1055	747 70.81	308 29.19
Practical	2569	1442 56.13	1127 43.87	1514	768 50.73	746 49.27	1055	674 63.89	381 36.11
Simulation	2567	1407 54.81	1160 45.19	1512	738 48.81	774 51.19	1055	669 63.41	386 36.59

Table IV. Candidates Retaking the Examination

	Total Sitting	Total Pass / %	Total Fail / %	Total Intern	# Intern Pass / %	# Intern Fail / %	Total Curr	# Curr Pass / %	# Curr Fail / %
Written	2020	711 35.20	1309 64.80	1480	486 32.84	994 67.16	540	225 41.67	315 58.33
Practical	1707	874 51.20	833 48.80	1199	564 47.04	635 52.96	508	310 61.02	198 38.98
Simulation	1614	859 53.22	755 46.78	1085	545 50.22	540 49.78	529	314 59.36	215 40.64

Descriptive Statistics of Candidate Performance

Scores on the written multiple-choice part of the examination are scaled from 0 to 150, with the criterion-referenced cut score established at 106. Scores on the practical are scaled from 0 to 50, with the criterion-referenced score required to pass established at 35. Scores on the written simulation range from 200 to 800, with the criterion-referenced cut score set at 500. Table V provides descriptive statistics on candidate performance for each part of the test. One-way Analysis of Variance (ANOVA) was used to test differences between internship and curriculum candidates. As seen below, scores for all curriculum candidates were significantly higher than those for internship candidates.

Table V. Candidate Score Distributions

	Written 274	Written 275
High Score	139	139
Low Score	40	67
Average Score	Overall 103.64 Internship 102.15 Curriculum 106.50**	Overall 106.19 Internship 104.68 Curriculum 108.99**
Standard Deviation	11.55	10.85

Written By Domain	Domain I n items = 31		Domain II n items = 59		Domain III n items = 42		Domain IV n items = 9		Domain V n items = 9	
	274	275	274	275	274	275	274	275	274	275
High Score	28	29	56	55	39	39	9	9	9	9
Low Score	5	8	13	19	9	7	1	0	1	2
Avg. Score	17.98	19.48	41.10	41.22	24.72	25.10	6.11	5.29	7.41	7.15
Std. Dev.	3.12	3.17	5.67	5.46	4.31	4.56	1.34	1.49	1.17	1.24

Practical	276	277	278	279
High Score	48	48	49	46
Low Score	10	8	5	4
Avg. Score	Overall 33.28 Internship 32.95 Curriculum 34.06*	Overall 35.20 Internship 34.27 Curriculum 36.47**	Overall 34.55 Internship 33.64 Curriculum 36.12**	Overall 32.98 Internship 32.50 Curriculum 34.17**
Std. Dev.	6.38	5.94	6.33	6.82

Simulation	Simulation 280	Simulation 281
High Score	747	800
Low Score	200	200
Avg. Score	Overall 501.10 Internship 488.96 Curriculum 519.41**	Overall 500.45 Internship 489.88 Curriculum 519.68**
Std. Dev.	97.34	98.52

NOTE: Curriculum Scores were significantly higher: * = $p < .05$ & ** = $p < .01$

Conclusion

NATABOC works hard to ensure that the certification examination and all aspects of its development and administration are fair and of high quality. In addition, the testing program has a strong foundation for content validity and functioning well to protect the public. The organization adheres to pertinent standards governing certification tests and implements an examination program that continues to be a valid and reliable measure of entry-level competence in the professional practice of athletic training. Only candidates who truly demonstrate competence are successful in achieving certification.