

**2005 Annual Report for the  
National Athletic Trainers Association Board of Certification**

**CASTLE Worldwide, Inc.  
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Having completed its fifth Role Delineation Study in 2004, the National Athletic Trainers Association Board of Certification (BOC) introduced the first forms of the test based on the new outline and specifications in April, 2005, the first administration of its testing year, which began on April 1, 2005 and ended March 31, 2006. With the change in content outline and with the end of the former internship route to qualification, the BOC undertook a standard-setting study to determine the passing standard for its examination in April, 2005.

The BOC made significant progress in moving toward a hybrid examination that combines the current three-part examination into a single test. Although no date has been announced for the inauguration of the hybrid examination, the BOC devoted considerable energy to the design of the new examination format and will make a prototype problem available along with materials to inform candidates about the nature of the new test and how to take it.

### **The Written, Simulation, and Practical Portions of the Examination**

Athletic trainers work in a variety of settings and draw on a broad array of sciences to provide service to the public. The BOC examination includes a written, multiple-choice examination with 140 scored items, a simulation examination comprising eight scored problems, and a practical assessment that includes from 12 to 13 problems in 2005. Candidates must pass each examination in order to become certified in athletic training. Each of the three parts of the test are designed to examine if candidates have sufficient knowledge, skill, and judgment as required for the practice of athletic training.

The BOC's test development activities included two meetings for each of the three portions of the examination in 2005. Experts in athletic training wrote and reviewed items for the examination in one of the meetings and then selected the various questions and problems for the 2006 testing year during the second meeting. These meetings help to ensure the quality of the examination program.

### **Analysis of the Examination**

The BOC undertakes many steps to ensure that its test adheres to pertinent requirements for examinations that are used in professional certification and licensure. Psychometric analysis is performed to investigate the three parts of the BOC examination and the manner in which each supports the BOC's decision making regarding the award or denial of certification. In complying with psychometric requirements, the BOC examination achieves the high level of validity and fairness essential to its stakeholders.

### **Reliability**

Among the essential properties of an examination is reliability, which is an estimate of the consistency of scores as a measure of competence. Table I reports reliability coefficients for all parts of the BOC examination for each form used during testing year. The Kuder Richardson [KR(20)] coefficient evaluates internal consistency reliability to describes the degree to which items on the test contribute consistently to candidates' scores. The standard error of measurement provides the range

in which the candidate's true score (if measured in absence of any error) resides. Relating to the practical, interrater reliability may be described as the percent of instances in which the examiners both mark "yes" plus the instances in which both mark "no" on the scoring criteria for individual candidates. Calculated as an intraclass correlation, interrater reliability evaluates consistency in the summary scores provided by each examiner.

**Table I. Examination Reliability and Standard Error of Measurement (S.E.M)**

	Written		Practical					Simulation				
Form #	342	343	347	348	349	350	347	344	345	344	345	344
Date			Apr	Jun	Aug	Nov	Feb	Apr	Jun	Aug	Nov	Feb
Reliability (KR20)	.82	.81	.74	.77	.79	.76	.77	.90	.90	.93	.91	.92
Interrater Rel. % Agreement			.87	.91	.91	.92	.87					
Interrater Rel. Intraclass			.84	.87	.90	.90	.86					
S.E.M.	5.33	5.40						7.60	7.80	7.96	7.92	7.90

### Candidate Performance on the Examination

Table II presents information about first-time and retake candidates in combination across all five test dates during the 2005 testing year. Altogether, 5091 candidates took the multiple-choice test, 3881 took the practical, and 3792 candidates sat for the written simulation. Table II reports the performance of the total candidate group on each part of the examination.

**Table II. All Candidates Taking the Examinations**

Exam	# Candidates	# Pass	% Pass	# Fail	% Fail
Written	5091	1628	31.98	3463	68.02
Practical	3881	1989	51.25	1892	48.75
Simulation	3792	2068	54.54	1724	45.46

First-time candidates in 2005 were almost entirely graduates from athletic training education programs accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). As reported in Table III, 2074 individuals took the multiple-choice examination for the first time, and 46.67% passed. The number of first-time candidates taking the practical in 2005 was 1923, with 55.49% passing. Of the 2116 individuals taking the written simulation examination for the first time in 2005, 60.92% passed. Annual Reports in previous years have compared the performance of internship and curriculum candidates; however, the BOC no longer accepts the graduates of internship courses of study and the number of first-time internship candidates (four) was not large enough to permit comparison. To take the examination as first-time internship candidates in 2005, the four individuals must have qualified prior to the beginning of the testing year.

**Table III. Candidates Taking the Examination for the First Time**

Exam	Total Sitting	Number Pass	% Pass	Number Fail	% Fail
Written	2074	968	46.67	1106	53.33
Practical	1923	1067	55.49	856	44.51
Simulation	2116	1289	60.92	827	39.08

1890 candidates took all three parts of the test in their first attempt, and 496, or 26.24%, passed. Table IV provides detail about the performance of this group.

**Table IV. First Time Candidates Passing All Three Parts on First Attempt**

Total Sitting	Total Pass	Total Pass %	Total Fail	Total Fail %
1890	496	26.24	1394	73.76

Table V reports the performance of candidates who retook all or portions of the examination in 2005. Retake candidates included 3017 taking the written (multiple-choice) portion, and 21.88% of them passed. 1958 individuals retook the practical portion of the examination and 47.09 of them passed. Written simulation retake candidates totaled 1676 with 46.48% passing. Internship candidates retaking the test in 2005 had qualified for the examination in 2004 or before and failed at least some portion of it in that year. Although the performance of internship candidates is reported in Table V, it is important to understand that it is not appropriate to evaluate the statistical significance of any differences observed because such comparisons should be based only on first-time candidate groups.

**Table V. Candidates Retaking the Examination**

Exam	Total Sitting	Total #/% Pass	Total #/% Fail	Total Intern	Intern #/% Pass	Intern #/% Fail	Total Curric	Curric #/% Pass	Curric #/% Fail
Written	3017	660/ 21.88	2357/ 78.12	999	89/ 8.91	910/ 91.09	2018	571/ 28.30	1447/ 71.70
Practical	1958	922/ 47.09	1036/ 52.91	592	147/ 24.83	445/ 75.17	1366	775/ 56.73	591/ 43.27
Simulation	1676	779/ 46.48	897/ 53.52	514	144/ 28.02	370/ 71.98	1162	635/ 54.65	527/ 45.35

### Descriptive Statistics of Candidate Performance

Descriptive statistics for each form of the BOC examination are shown in Table VI. Scaled scores ranged from 136 to 53 (out of 150 scale-score points) on Form 342 and 139 to 57 for form 343 for the multiple-choice examination. High scores on the practical were 48, 47, 46, 50, and 48 on a scale from 0 to 50. Alternatively, low scores on the practical were 0, 0, 0, 7, and 7. The written simulation is scaled from 200 to 800, with the passing standard anchored at 500. High scores were 766, 738, 684, 751, and 735, while the low score was 200 on each form and test date except February when it was 241. Table VI provides detail about candidate performance on each part of the BOC examination.

**Table VI. Candidate Scores**

	Written Form 342	Written Form 343
High Score	136	139
Low Score	53	57
Avg. Score	99.70	99.05
Std. Dev.	12.40	12.21

	Practical Form 347 (Apr)	Practical Form 348 (Jun)	Practical Form 349 (Aug)	Practical Form 350 (Nov)	Practical Form 347 (Feb)
High Score	48	47	46	50	48
Low Score	0	0	0	7	7
Avg. Score	34.33	34.07	33.35	34.57	31.46
Std. Dev.	7.11	6.84	7.26	7.47	7.7

  

	Simulation Form 344 (Apr)	Simulation Form 345 (Jun)	Simulation Form 344 (Aug)	Simulation Form 345 (Nov)	Simulation Form 344 (Feb)
High Score	766	738	684	751	735
Low Score	200	200	200	200	241
Avg. Score	500.79	501.12	501.90	501.15	500.46
Std. Dev.	99.04	97.53	94.41	97.24	99.97

There are six performance domains in the content framework for the examination, consistent with the Role Delineation Study upon which the examination is based (2004). Table VII reports descriptive statistics at the domain level for the written examination, for form 342 first and then for form 343. The Role Delineation Study also provides the basis for the practical and simulation tests but it is not possible to compute domain-level scores for those tests because of their weighting structure.

**Table VII. Domain Scores (Raw) for Written Examination Form 342 and 343**

	Form 342 Domain 1	Form 342 Domain 2	Form 342 Domain 3	Form 342 Domain 4	Form 342 Domain 5	Form 342 Domain 6
Number of Items	21	33	28	31	15	12
High Score	20	33	27	29	15	12
Low Score	4	7	5	6	4	2
Avg. Score	12.79	22.12	17.61	18.40	11.14	8.51
Std. Dev.	2.38	4.11	3.32	3.76	1.78	1.74

  

	Form 343 Domain 1	Form 343 Domain 2	Form 343 Domain 3	Form 343 Domain 4	Form 343 Domain 5	Form 343 Domain 6
Number of Items	21	33	28	31	15	12
High Score	19	33	27	30	15	12
Low Score	4	4	5	6	3	2
Avg. Score	11.42	20.24	17.51	18.87	10.59	7.26
Std. Dev.	2.26	4.34	3.30	3.78	1.66	1.86

## **Conclusion**

Statistics concerning the quality of the BOC examination as a measurement device indicate that the examination complies with psychometric requirements that pertain to certification and licensure tests. Notably, estimates of reliability and equivalence across forms for the various parts of the examination are quite strong. Likewise, candidate performance on all parts of the examination demonstrate the public protection mission of the BOC.

The BOC invests considerable energy and resources to ensure that the examination and all aspects of its development and administration are fair and of high quality. The organization implements an examination program that maintains excellent validity and reliability as a measure of entry-level competence in the athletic training.