



## **PILATES METHOD ALLIANCE CERTIFICATION COMMISSION PASSING STANDARD STUDY REPORT**

**Castle Worldwide, Inc.  
June 2014**

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The Pilates Method Alliance Certification Commission (PMACC®) developed a new 150-item (125 scored, 25 unscored) version of the PMA-Certified Pilates Teacher (CPT®) examination in 2013. This examination was designed to assess minimally acceptable knowledge of the duties performed by Pilates teachers. PMACC established the recommended score needed to pass the examination using consequence data collected in early 2014 after a meeting held in June 2013. Castle Worldwide, Inc., a professional testing service company specializing in the development of licensure and certification examinations, provided leadership and statistical consultation for this decision. The method used to establish the recommended cut score was a modified Angoff technique (1971), a well-researched and widely used method for setting criterion-referenced cut scores (See Appendix A.).

### **PURPOSE**

A high-quality examination must have a defensible passing score. That is, the cut-off score that separates passing examinees from failing examinees must be determined in a systematic and reasonable way. Generally, only criterion-referenced procedures are accepted in the standards for credentialing examinations because these methods define the minimally acceptable level of competence and evaluate each question in light of minimum competence (Cizek, 2001). Criterion-referenced procedures provide a demonstrable linkage between the passing standard and public protection.

This standard-setting project was designed to establish the score that accounts for minimally acceptable knowledge of the duties performed by Pilates teachers. To achieve this objective, the appointed examination reviewers selected by PMACC followed the accepted methods delineated by Castle and implemented a modified Angoff technique in a Delphi study.

### **METHOD**

For the June 2013 meeting (See Appendix B.), PMACC appointed a panel of 12 expert Pilates teachers with extensive experience and three to eight years working as PMA-Certified Pilates Teachers (See Appendix C.). The panel was international in composition and included individuals whose careers and professional qualifications indicated strong knowledge of Pilates teaching and understanding of the role of the PMA-Certified Pilates Teacher.

After a discussion of the requisite security for a passing standard study (See Appendix D.), Castle provided the panelists with the multiple-choice questions included on the examination and an explanation of the modified Angoff technique for establishing a recommended passing score (See Appendix A.). The panelists took the exam and graded themselves, and then Castle led the panel in a discussion of the meaning of minimally acceptable knowledge by asking panelists to list the kinds of responsibilities required of Pilates teachers. Panelists were advised to recall their own abilities when they were minimally knowledgeable or to recall individuals they have known in their careers who fit the definition (See Appendix E.).

After this discussion, in which the panelists reached a shared understanding of minimally acceptable knowledge, Castle instructed the panel to estimate the percentage of minimally knowledgeable candidates who would answer each question correctly. Panelists were told that their estimates should account for the percentage of minimally knowledgeable candidates who would answer the question correctly, given that it would be unusual for more than 95% of the candidates to answer any question correctly and that it is reasonable to assume that at least 25% would answer any question correctly by guessing.

The panelists engaged the Delphi study and discussed their ratings of each question in detail. In doing so, the panelists refined their understanding of the critical definitions and tasks for the exercise. Panelists who disagreed by more than 40% (four expected standard deviations) were asked to discuss the reasons for their disagreement. In doing so, panelists further refined their understanding of minimal competence and candidate performance.

### **ANALYSIS**

After collecting the data (See Appendix F.) from the 12 panelists, Castle calculated the minimally acceptable score. The panelists' estimates were averaged, and the number of questions that corresponded to the mean was determined. The reliability of these ratings was approximately 0.933 as indexed by Cronbach's alpha, which is the intraclass correlation for internal consistency (See Appendix G.). The grand mean of the panelists' data was 95.78 items, and the SEM was 0.5449 items, producing a 95% confidence interval ( $t=2.201$ ) of [97.28, 94.28]. After a review of consequence data (See Appendix H.) from the 2014 administration to approximately 102 test takers, PMACC selected 94 items correct as the passing standard. Scores are reported using a scaled score with a range of 200 to 800 where 500 is passing (See Appendix I.).

While Castle provided leadership for the passing-point determination and provided the required materials, instructions, and analysis necessary for a legally defensible passing point, PMACC is ultimately responsible for the final decision regarding the passing point. However, given that PMACC has adhered to the guidelines and standards set forth by a modified Angoff technique, Castle will support PMACC in any discussions regarding the selected passing point.

### **REFERENCES CITED**

- Angoff, W. H. (1971). Scales, Norms, and Equivalent Scores. In Thorndike, R. L. (Ed.), *Educational Measurement*, 2<sup>nd</sup> Edition. Washington, DC: American Council on Education.
- Cizek, G. J. (2001). *Setting Performance Standards: Concepts, Methods, and Perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates.

**APPENDIX A:**  
**HOW IS THE PASSING POINT DETERMINED FOR THE**  
**PMACC PMA-CERTIFIED PILATES TEACHER EXAMINATION?**

The methodology to determine the cut score, or passing point, used in this examination is a criterion-referenced approach called a modified Angoff technique. This technique currently is considered by the testing profession to be one of the most defensible criterion-referenced methods available for setting passing points. It relies on the pooled judgments of content experts. For example, in this approach, a group of experts is asked to judge each item on the test. The criterion used to judge each item is formed into a question: “What is the probability that a ‘minimally acceptable’ candidate will answer this item correctly?” This question prompts the judges to consider a group of minimally acceptable candidates and what proportion of that group will answer each item correctly.

The average of the proportions, or probabilities, is multiplied by the total number of items on the test. The result then represents the “minimally acceptable” score. The final passing score for this examination is based on this pooled judgment and includes a statistical adjustment for testing error.

## Pilates Method Alliance

Certified Pilates Teacher  
Passing Standard Study

07 June 2013  
Miami, FL

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Hosts: Deborah Lessen  
Chair at Pilates Method Alliance Certification Commission

Facilitator: James Penny, PhD  
Senior Psychometrician  
Castle Worldwide

Schedule: 8:00 a.m. To 5:00 p.m.

### Sequence of events

1. Explanation of security
2. Take the current exam
  - a. We ask that discussion not occur until everyone is finished.
3. Score your exam
  - a. You do not have to share your score, and we will not record your score.
4. Discuss candidate qualifications and minimal competency
5. Estimate item difficulty
  - a. We will collect your data in a spreadsheet.
  - b. You may discuss each item with your colleagues in the room.
  - c. You will probably fine-tune your difficulty estimates a few times.
  - d. This process is called a modified Angoff Passing Standard Study.
6. Closing

Notes: Breaks are not scheduled. You may step out of the room when you need. Lunch will be at about noon.

Appendix C: Table of Panelists

Name	Location	Title	Employer	Years in field	Years PMA certified	Employer and academic and certification credentials PMA
Sally Anderson	Australia	Director, ITC-ITO	Self	22	8	International company registered in Australia
Gail Giovannello	New York	Owner	Self	23	4	Seasoned- studied with many high profile founders
Marissa Lins	Wisconsin	Owner	Self	9	4	1st Licensed Pilates school in Wisconsin
Ann McMillan	Canada	Owner	Self	21	8	Influence spreads in both English and French
Bernie Nelson	N. Florida	Owner	Self	10	6	Brings Fitness experience: certified ACE and APEX trainer
Nora St. John	California	Education Director	Balanced Body	14	7	Ed Director of one of the largest international, Pilates training programs.
Jolita Trahan	Italy	Director	Self	14	3	Graduate degree in education; internationally known Pilates Instructor
Jennifer Zumann	Chicago	Owner	Self	16	6	Broad understanding of various allied modalities.
Anna Alvarez	S. Florida	Owner	Self	22	6	Continuing Education Specialist for the PMA for 13 years; maintains a studio in Miami, and offers classes internationally.
Shelly Power	S. Florida	Co-Founder	Self	15	2	Combines training in Dance, Pilates, and Physical Therapy in a program that extends internationally.
Jackie Weiner	S. Florida	Owner	Self	18	3	Graduate degree in education, highly experienced in Pilates, and knowledgeable of the daily Studio dynamics.
Mark Trudeau	Washington DC	Owner	Self	14	6	Strong influence in Dance and fitness, two of the strongest influences to Pilates.

**Candidate demographic:** The Pilates method is international, but follows strongly the method as defined by one founder. Candidates are usually familiar with other allied modalities including personal training, Dance, Physical Therapy, Massage Therapy, Movement Arts, and academic studies in physical education. **Panel representation:** The representation of the Panel addresses this international, knowledgeable method and adds some additional skills in Education and Business development.



**SECURITY AGREEMENT for  
Passing Standard Study Participants  
PMA**

I, \_\_\_\_\_, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

I understand that information obtained or knowledge gained during the examination development process, which is not public information, cannot be used at any time to assist individuals preparing for the examination. This includes, but is not limited to, the sharing of such information during private instruction, workshops, or training programs; and/or the development, modification, or enhancement of training programs, courses, or workshops based on this information. I agree that I will not allow my participation in the item writing process to be used to promote specific training programs, courses, or workshops.

Furthermore, I understand that if I violate any of these requirements, rules, or regulations, I will be subject to legal action.

\_\_\_\_\_  
*Signature of Participant* \_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Name (Please Print)*

\_\_\_\_\_  
*Business Street Address*

\_\_\_\_\_  
*City* *State* *ZIP*

\_\_\_\_\_  
*Home Phone* *Business Phone* *Email*

### **Eligibility requirements**

The exam is available to any Pilates teacher regardless of their Pilates training background who meets

ONE of the following eligibility requirements:

1. Candidates must be at least 18 years of age.
2. Provide verification of Pilates teacher-training proficiency using 450 hours of training on all apparatus and all levels of mat as a basis.

### **Definition of the certified Pilates Teacher**

The PMA-Certified Pilates Teacher creates and implements safe and effective individualized programs for apparently healthy clients to improve health and fitness through exercise and physical activity. The goal of a PMA Certified Pilates Teacher is to impart the knowledge skill and confidence for clients to exercise for a lifetime. By awarding the title of Certified Pilates Teacher, the PMA Certification Program is formally recognizing the Pilates teacher who has provided evidence that he or she meets accepted professional standards.

**Scale: Panel Angoff data**

**Case Processing Summary**

		N	%
Cases	Valid	125	100.0
	Excluded <sup>a</sup>	0	.0
	Total	125	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.933	12

**Intraclass Correlation Coefficient**

	Intraclass Correlation <sup>a</sup>	95% Confidence Interval		F Test with True Value 0	
		Lower Bound	Upper Bound	Value	df1
Single Measures	.538 <sup>b</sup>	.471	.609	14.971	124
Average Measures	.933 <sup>c</sup>	.915	.949	14.971	124

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.
- b. The estimator is the same, whether the interaction effect is present or not.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

**Intraclass Correlation Coefficient**

	F Test with True Value 0	
	df2	Sig
Single Measures	1364	.000
Average Measures	1364	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.