

Research Brief: Predicting early nursing school performance in a BSN program

How do ATI TEAS preparedness levels predict RN Fundamentals performance?

ATI TEAS® is an assessment of academic preparedness to enter a nursing program. As such, it is often used by schools of nursing as one of the criteria to select students for entrance into the program. Some programs choose to adopt one of several performance level descriptors, known as academic preparedness categories, associated with ATI TEAS as a minimum score for admission. This analysis examines the relationship between ATI TEAS scores, specifically the academic preparedness categories, and early academic performance in a BSN nursing program as measured by ATI's RN Fundamentals 2016 assessment.

Introduction

For nursing faculty and aspiring students alike, the admissions decision process holds great import. For nursing faculty, the ability to evaluate prospective students' potential to succeed in nursing school is of paramount concern. In an effort to gain as much information as possible about applicants for use in the decision-making process, programs employ a variety of admissions criteria. One of these admissions criteria is the ATI TEAS assessment, published by Assessment Technologies Institute, LLC (ATI). ATI TEAS assesses students' skills in the areas of reading, math, science, and English and language usage. Students taking ATI TEAS receive separate scores for each of the content areas assessed, as well as an overall composite score that represents their performance across the ATI TEAS subsections. The ATI TEAS was updated from TEAS V in 2016; although the ATI TEAS was equated to the previous version of the assessment (TEAS V) during the development process, only ATI TEAS data were analyzed for this paper.

As an aid in interpreting and making meaningful decisions based on ATI TEAS scores, ATI developed academic preparedness categories that correspond to ranges of student performance on ATI TEAS. The ATI TEAS academic preparedness categories were developed through a standard setting process conducted with 17 nurse educators representing PN, ADN, diploma, BSN, and accelerated BSN program types from institutions of various sizes and types from across the United States. For more detailed information about the cut score-setting process and the academic preparedness categories, refer to the *ATI TEAS Cut Score Executive Summary* (ATI, 2010). Because the ATI TEAS was equated to previous versions of the test, the standard setting process was not repeated, and the preparedness-level cut points remain the same as for previous versions of the assessment.

Because one purpose of ATI TEAS is to select students prepared to be successful in a nursing program, the early nursing school performance of admitted students is a key piece of evidence supporting its use. For this paper's analyses, the RN Fundamentals 2016 assessment, part of ATI's RN Content Mastery Series 2016, was chosen as a measure of early academic performance in a nursing program. This choice of criterion was made because it provides a standard point of comparison, as compared with first-semester GPA or teacher ratings, which are highly variable across programs.

Additionally, the RN Fundamentals 2016 assessment has associated proficiency levels which are frequently used by programs and provide a convenient and interpretable measure of achievement. Similar to the ATI TEAS preparedness levels, RN Content Mastery Series 2016 proficiency level cut scores were established by a panel of nurse educators. For more information on the details of the standard-setting process, refer to the *RN CMS Cut Score Study Executive Summary* (ATI, 2013).

The following research questions are explored in this paper.

- What is the relationship between ATI TEAS scores and RN Fundamentals 2016 scores?
- What is the pattern of Fundamentals proficiency level achievement for students of differing ATI TEAS preparedness levels?

Methodology

For these analyses, the first-attempt scores for individuals taking an RN Fundamentals 2016 exam in a BSN program between August 31, 2016, and October 12, 2017, were matched with first-attempt ATI TEAS scores already in the system. Only those assessments marked as 80% complete and 30% correct, and with all 4 subsections of ATI TEAS completed, were included in the dataset. These selection criteria returned a final sample size of 3,797 student records spanning 226 nursing programs for analysis.

ATI applies the standard filtering criteria of 80% complete and 30% correct with the reasoning that an examinee making a genuine effort would be able to complete 80% of the assessment with at least 30% of test items correct. Because all items are 4-option multiple choice, an individual could be expected to answer 25% of the items correct based on guessing alone. For more information on the ATI TEAS speededness analyses, refer to the *ATI TEAS Technical Report* (ATI, 2017).

Results

Relationship between ATI TEAS and Fundamentals scores

To examine the relationship between the ATI TEAS and Fundamentals assessment, Pearson correlations were run for the four ATI TEAS subscores and composite score with Fundamentals score. All correlations are reported in Table 1.

TABLE 1. *Correlation of the TEAS subscores and composite score with Fundamentals score (n = 3,797)*

	Reading	Math	Science	English and Language Usage	Composite score
Fundamentals 2016	0.379	0.233	0.401	0.337	0.456

All correlations significant at $p < 0.001$.

Evaluation of the correlations in Table 1 suggests that the ATI TEAS is a useful predictor of achievement early in a nursing program, as measured by the Fundamentals assessment. Further, the ATI TEAS total score has a stronger relationship with Fundamentals scores than do the individual subscores. Accordingly, the following analysis explores the established national preparedness levels for the ATI TEAS composite score in predicting Fundamentals proficiency levels.

ATI TEAS preparedness levels and RN Fundamentals proficiency level

To evaluate the relationship between ATI TEAS preparedness levels and individuals' later proficiency level achievement on the RN Fundamentals 2016, a crosstabs analysis was run to examine the distribution of scores in each ATI TEAS preparedness category by Fundamentals proficiency level. Table 2 displays the results of this analysis as the percentage of individuals within each ATI TEAS preparedness level scoring at each Fundamentals proficiency level. An examination of Table 2 reveals that, as individuals score in successively higher ATI TEAS preparedness categories, the percentage scoring at higher proficiency levels on the Fundamentals assessment increases. Shading on Table 2 indicates the highest percentage of Fundamentals proficiency within each ATI TEAS preparedness level.

TABLE 2. Crosstabs of ATI TEAS academic preparedness category by Fundamentals proficiency level (n = 3,797)

ATI TEAS Academic Preparedness		Fundamentals Proficiency Level			
		0	1	2	3
Developmental	% within category	70.6%	23.5%	5.9%	0.0%
	n	12	4	1	0
Basic	% within category	38%	40.9%	20.5%	0.6%
	n	65	70	35	1
Proficient	% within category	21.2%	40.9%	33.9%	4%
	n	388	748	620	73
Advanced	% within category	6.6%	26.5%	54.3%	12.7%
	n	103	417	853	199
Exemplary	% within category	1.4%	13.9%	51%	33.7%
	n	3	29	106	70

Proficiency level 2 on the Fundamentals assessment is a common benchmark among nursing programs. Using this proficiency level as a standard for success, it appears that achievement of the advanced preparedness level or better on ATI TEAS is associated with a majority of students achieving success on the Fundamentals assessment. However, a more common standard for programs using ATI TEAS is the Proficient level. Table 2 also shows that nearly 38% of students admitted with an initial ATI TEAS score in the Proficient category achieve Level 2 on the Fundamentals assessment.

To more clearly illustrate the relationship between these common benchmarks on the two assessments, scores on the ATI TEAS were dichotomized into “below Proficient” and “Proficient and above.” Similarly, scores on the Fundamentals assessment were dichotomized into “below Level 2” and “Level 2 and above.” The heavy lines on Table 2 show these points of dichotomization and provide an aid in comparison of Tables 2 and 3. Table 3 shows the percentage of individuals at each ATI TEAS level (below Proficient, Proficient and above) achieving proficiency on the Fundamentals assessment.

TABLE 3. *Crosstabs of dichotomized ATI TEAS level (Proficient and above) by dichotomized Fundamentals level (n = 3,797)*

ATI TEAS Academic Preparedness		Fundamentals Proficiency Level	
		Below level 2	Level 2 and above
Below Proficient	% within category	80.3%	19.7%
	n	151	37
Proficient and above	% within category	46.8%	53.2%
	n	1688	1921

Because of the larger percentage of students scoring at the advanced level and above who also achieve level 2 or higher on the Fundamentals, TEAS scores were also dichotomized into two levels on this basis (below advanced, advanced and above), and an additional crosstabs analysis of dichotomized TEAS and Fundamentals scores was performed. Table 4 displays these results.

TABLE 4. *Crosstabs of dichotomized ATI TEAS level (advanced and above) by dichotomized Fundamentals level (n = 3,797)*

ATI TEAS Academic Preparedness		Fundamentals Proficiency Level	
		Below level 2	Level 2 and above
Below advanced	% within category	63.8%	36.2%
	n	1287	730
Advanced and above	% within category	31%	69%
	n	552	1228

A comparison of Tables 3 and 4 might make the use of the advanced level as a BSN standard for ATI TEAS attractive. However, it is also important to consider that a large percentage of students with TEAS scores in the Proficient level go on to achieve Level 2 or above on the Fundamentals assessment. In light of these data, it seems especially important for programs to consider their applicant pool and admitted cohort in terms of their expectations for incoming students and the support that the program provides to students in the Proficient category. Additionally, programs could benefit from considering the data here in conjunction with their own program-specific analysis of admitted students' TEAS scores and subsequent performance.

Conclusion

The magnitude of the correlation between ATI TEAS and Fundamentals scores indicates the usefulness of ATI TEAS as an indicator of preparedness for early academic success in a nursing program. Although it is ATI's position that selection into a nursing program should never be based on a single criterion, such as ATI TEAS scores, the correlations presented here do support the use of ATI TEAS scores as a selection criterion in combination with additional information about applicants.

Additionally, the ATI TEAS preparedness level data are a powerful complement to the established preparedness level descriptors and provide an enhanced picture of how students at various levels are likely to perform early in a nursing program. For programs choosing a preparedness level standard for use with ATI TEAS, it is particularly important to consider expectations for early program academic performance, such as Fundamentals proficiency level achievement, and the support mechanisms that the program has available, in conjunction with the data presented here.

References

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Assessment Technologies Institute, LLC. (2017). *ATI TEAS technical report*. Leawood, KS: Author.

If you have any questions regarding this paper or its findings, please do not hesitate to contact us at aticommunications@atitesting.com