

Predicting early nursing school performance in an ADN program: How do the ATI TEAS preparedness levels predict RN CMS Fundamentals performance?

The ATI Test of Essential Academic Skills (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 a program. Some programs choose to adopt one of several performance level descriptors, known as academic preparedness categories, associated with the ATI TEAS as a minimum score for admission. This analysis examines the relationship between the ATI TEAS scores, specifically the academic preparedness categories, and early academic performance in an ADN nursing program as measured by ATI's RN Content Mastery Series (CMS) Fundamentals 2016 and 2019 assessments.

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. 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 scores were 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 the ATI TEAS scores, ATI developed criterion referenced academic preparedness categories that correspond to ranges of student performance on the ATI TEAS. The ATI TEAS academic preparedness categories were developed through a standard setting process conducted with 20 nurse educators representing ADN, BSN, Diploma, PN, and accelerated ADN program types from institutions of various sizes and types across the United States. For more detailed information about the cut score-setting process and the academic preparedness categories, the reader is directed to the ATI TEAS Academic Preparedness Level Summary (ATI, 2020). Because the ATI TEAS was equated to previous versions of the test, the preparedness-level cut points remain the same as for previous versions of the assessment.

As one purpose of the ATI TEAS is to help 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 CMS Fundamentals 2016 and 2019 assessments, part of ATI's RN Content Mastery Series, were chosen as a measure of early academic performance in a nursing program. This choice of criterion was made because it provides a standardized point of comparison, as compared with first-semester GPA or teacher ratings, which may be highly variable across programs.

Additionally, the RN CMS Fundamentals 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, The RN Content Mastery Series proficiency level cut scores were established by a panel of nurse educators. For more information on the details of the standard-setting process, please see the RN CMS 2019 National Standard Setting Study Report (ATI, 2020).

The following research questions are explored in this paper:

- What is the relationship between the ATI TEAS scores and the RN CMS Fundamentals scores?
- What is the pattern of the RN CMS 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 CMS Fundamentals 2016 or 2019 exam in an ADN program between October 15, 2018 and November 11, 2020 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 the ATI TEAS completed, were included in the dataset. These selection criteria returned a final sample size of 39,866 student records spanning 598 nursing programs for analysis.

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

Results

Relationship between the ATI TEAS and the RN CMS Fundamentals scores

In order to examine the relationship between the ATI TEAS and the RN CMS Fundamentals assessment, Pearson correlations were run for the four ATI TEAS sub scores and the composite score with the RN CMS Fundamentals scores. All correlations are reported in Table 1.

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 RN CMS Fundamentals assessment. Further, the ATI TEAS total score has a stronger relationship with the RN CMS Fundamentals score than do the individual sub scores. Accordingly, the following analysis explores the established national preparedness levels for the ATI TEAS composite score in predicting the RN CMS Fundamentals proficiency levels.

Table 1. Correlation of the ATI TEAS sub scores and composite score with the RN CMS Fundamentals score (n=39,866)

	Reading	Math	Science	English and Language Usage	Composite score
Fundamentals	.358	.300	.340	.303	.414

All correlations significant at $p < .001$.

ATI TEAS preparedness levels and the RN CMS Fundamentals proficiency levels

In order to evaluate the relationship between the ATI TEAS preparedness levels and individuals' later proficiency level achievement on the RN CMS Fundamentals, a crosstabs analysis was run to examine the distribution of scores in each ATI

TEAS preparedness category by the RN CMS Fundamentals proficiency levels. Table 2 displays the results of this analysis as the percentage of individuals within each ATI TEAS preparedness level scoring at each RN CMS 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 RN CMS Fundamentals assessment also increases. Proficiency level 2 on the RN CMS Fundamentals assessment is a common benchmark among nursing programs. Using this proficiency level as a standard for “success,” it appears that achievement of the Proficient preparedness level or better on the ATI TEAS is associated with a majority of students achieving success on the RN CMS Fundamentals assessment.

In order 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 RN CMS Fundamentals assessment were dichotomized into “below level 2” and “level 2 and above.” Table 3 shows the percentage of individuals at each ATI TEAS level (below Proficient; Proficient and above) achieving proficiency on the RN CMS Fundamentals assessment.

Table 3. Crosstabs of Dichotomized ATI TEAS Preparedness levels by Dichotomized RN CMS Fundamentals Proficiency Level (n=20,844)

Table 2. Crosstabs of the ATI TEAS academic preparedness category by the RN CMS Fundamentals proficiency level (n=39,866)

ATI TEAS Academic Preparedness		Fundamentals Proficiency Level			
		0	1	2	3
Developmental	% within category	43.7%	40.1%	16.2%	0.0%
	n	62	57	23	0
Basic	% within category	21.1%	44.0%	34.9%	0.0%
	n	724	1,508	1,196	0
Proficient	% within category	6.5%	35.0%	52.3%	6.2%
	n	1,637	8,772	13,089	1,551
Advanced	% within category	0.6%	20.8%	60.4%	18.3%
	n	60	2,181	6,334	1,915
Exemplary	% within category	0.0%	5.9%	52.4%	41.6%
	n	0	45	397	315

Conclusion

The magnitude of the correlation between the ATI TEAS and the RN CMS Fundamentals scores demonstrates the usefulness of the 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 the ATI TEAS scores, the correlations presented here do support the use of the 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 the ATI TEAS, it is particularly important to consider expectations for early program academic performance, such as the RN CMS Fundamentals proficiency level achievement, and the support mechanisms that the program has available, in conjunction with the data presented here.

References

- Assessment Technologies Institute, LLC. (2020). ATI TEAS Academic Preparedness Level Summary. Author: Leawood, KS.
- Assessment Technologies Institute, LLC. (2020). RN Content Mastery Series 2019 National Standard Setting Study Report. Author: Leawood, KS.
- Assessment Technologies Institute, LLC. (2017). ATI TEAS Technical Manual. Author: Leawood, KS.

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