# Predicting early nursing school performance in a BSN 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 nursing 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 a BSN 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). The ATI TEAS assesses students' skills in the areas of reading, math, science, and English and language usage. Students taking the 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 the TEAS V in 2016; although the ATI TEAS was equated to the previous version of the assessment (TEAS V) during the development process, only the 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 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 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, the reader is directed to the ATI TEAS Academic Preparedness Level Summary (ATI, 2020).

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 2016 and 2019 Fundamentals 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 exam in a BSN 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 sub sections of the ATI TEAS completed, were included in the dataset. These selection criteria returned a final sample size of 31,782 student records spanning 471 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 on the ATI TEAS 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 scores and the RN CMS Fundamentals scores, Pearson correlations were run for the four ATI TEAS sub scores and the composite score with the RN CMS Fundamentals score. 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 scores than do the individual sub-scores. Accordingly, the following analysis explores the established national preparedness levels for the ATI TEAS composite score

**Table 1.** Correlation of the ATI TEAS sub-scores and composite score with the RN CMS Fundamentals score (n=31,782)

|  | Reading | Math | Science | English and Language Usage | Composite score |
|---|---|---|---|---|---|
| **Fundamentals** | .356 | .303 | .380 | .327 | .433 |

All correlations significant at $p<.001$.

in predicting the RN CMS Fundamentals proficiency levels.

**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 of examinees scoring at higher proficiency levels on the RN CMS Fundamentals assessment also increases.

**Table 2.** Crosstabs of the ATI TEAS academic preparedness category by the RN CMS Fundamentals proficiency levels (n=31,782)

| ATI TEAS Academic Preparedness | | Fundamentals Proficiency Level | | | |
|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 |
| Developmental | % within category | 55.8% | 29.5% | 14.7% | 0.0% |
| | n | 53 | 28 | 14 | 0 |
| Basic | % within category | 25.7% | 41.8% | 32.5% | 0.0% |
| | n | 508 | 826 | 643 | 0 |
| Proficient | % within category | 10.3% | 36.0% | 48.4% | 5.4% |
| | n | 1,632 | 5,728 | 7,700 | 853 |
| Advanced | % within category | 2.2% | 22.8% | 57.2% | 17.8% |
| | n | 271 | 2,842 | 7,126 | 2,223 |
| Exemplary | % within category | 0.0% | 10.0% | 52.2% | 37.8% |
| | n | 0 | 134 | 697 | 504 |

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 Advanced preparedness level or better on the ATI TEAS is associated with a majority of students achieving "success" on the RN CMS Fundamentals assessment. However, a more common standard for programs using the ATI TEAS is the Proficient level; Table 2 also shows that 48.4% of students admitted with an initial ATI TEAS score in the Proficient category achieve level 2 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. Because of the larger percentage of students scoring at the Advanced level and above who also achieve level 2 or higher on the RN CMS Fundamentals, the ATI TEAS scores were also dichotomized into two levels on this

basis (below Advanced; Advanced and above), and an additional crosstabs analysis of dichotomized ATI TEAS and RN CMS Fundamentals scores was performed. Table 4 displays these results.

**Table 3**. Crosstabs of Dichotomized ATI TEAS levels by Dichotomized RN CMS Fundamentals levels (n=31,782)

| Fundamentals Proficiency Level | | | |
|---|---|---|---|
| **ATI TEAS Preparedness** | | Below Level 2 | Level 2 and Above |
| **Below Proficient** | % within category n | 68.3% 1,415 | 31.7% 657 |
| **Proficient and Above** | % within category n | 35.7% 10,607 | 64.3% 19,103 |

**Table 4**. Crosstabs of Dichotomized ATI TEAS levels (Advanced and above) by Dichotomized RN CMS Fundamentals levels (n=31,782)

| Fundamentals Proficiency Level | | | |
|---|---|---|---|
| **ATI TEAS Preparedness** | | Below Level 2 | Level 2 and Above |
| **Below Advanced** | % within category n | 48.8% 8,775 | 51.2% 9,210 |
| **Advanced and Above** | % within category n | 23.5% 3,247 | 76.5% 10,550 |

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

## 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, 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.