

# Predicting early nursing school performance in a PN program: How do the ATI TEAS preparedness levels predict PN CMS Fundamentals performance?

*ATI's Test of Essential Academic Skills (TEAS) is an assessment used to measure students' academic preparedness to enter a nursing program. It is used by nursing schools as one of the admissions criteria to select students for entrance into a nursing program. Many 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 PN nursing program as measured by ATI's PN Content Mastery Series (CMS) Fundamentals of Nursing 2017 and 2020 assessments.*

## Introduction

The admissions decision process is important for both nursing faculty and aspiring students. For nursing faculty, the ability to evaluate prospective students' potential to succeed in nursing school is of paramount concern. Programs use a variety of admissions criteria to gain as much information as possible about applicants for use in the decision-making process. One common criterion 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. Examinees taking the ATI TEAS will 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.

As an aid in interpreting and making meaningful decisions based on the ATI TEAS scores, ATI has developed criterion referenced scoring standards called the 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 standard setting process and the academic preparedness categories, the reader is directed to the ATI TEAS Academic Preparedness Level Summary (ATI, 2020).

Because the purpose of the ATI TEAS is to help nursing schools identify students who are 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 PN CMS Fundamentals 2017 and 2020 assessments, part of ATI's PN CMS, were chosen as measures of early academic performance in a nursing program. This criterion was selected because it provides a standardized point of comparison, as compared to first-semester GPA, which may be highly variable across programs.

Additionally, the PN CMS Fundamentals assessment has associated proficiency levels which are commonly used to provide a convenient and interpretable measure of achievement. Like the ATI TEAS preparedness levels, the PN CMS 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 PN Content Mastery Series 2020 Proficiency Levels Summary (ATI, 2020).

The following research questions are explored in this paper:

- What is the relationship between the ATI TEAS scores and the PN CMS Fundamentals scores?

- What is the pattern of the PN CMS Fundamentals proficiency level achievement for students of differing ATI TEAS preparedness levels?

## Methodology

For these analyses, the first-attempt scores for individuals taking a PN CMS Fundamentals 2017 or 2020 exam in a PN program between November 6, 2017 and November 4, 2020 were matched with first-attempt ATI TEAS scores. Only those assessments marked as 80% complete or more and at least 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 30,863 student records comprising 655 nursing programs for the analyses.

Eighty percent complete and thirty percent correct are standard ATI filtering criteria that is used with the 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 of the ATI TEAS items are 4-option multiple choice, an examinee could be expected to answer 25% of the items correctly based on guessing alone. For more information on the ATI TEAS speededness analyses, the reader is referred to the ATI TEAS Technical Manual (ATI, 2017).

## Results

### Relationship between the ATI TEAS and the PN CMS Fundamentals scores

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

**Table 1.** Correlation of the ATI TEAS sub scores and composite score with the Fundamentals score (n=30,863)

|              | Reading | Math | Science | English and Language Usage | Composite Score |
|--------------|---------|------|---------|----------------------------|-----------------|
| Fundamentals | .459    | .372 | .394    | .376                       | .519            |

All correlations significant at  $p < .001$ .

### ATI TEAS preparedness levels and the PN CMS Fundamentals proficiency levels

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

An examination of Table 2 reveals that, as examinees score in successively higher ATI TEAS preparedness categories, the percentage scoring at higher proficiency levels on the PN CMS Fundamentals assessment correspondingly increase.

Proficiency level 2 on the PN CMS Fundamentals assessment is a commonly used 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 PN CMS Fundamentals assessment.

Nearly sixty percent of individuals scoring at Proficient or above on the ATI TEAS go on to achieve at Proficiency Level 2 or better on the PN CMS Fundamentals assessment.

In order to more clearly illustrate this interpretation, scores on the ATI TEAS were dichotomized into “below Proficient” and “Proficient and above”. Similarly, scores on the PN CMS Fundamentals assessment were dichotomized into “below level 2” and “level 2 or above”. Table 3 shows the percentage of individuals at each ATI TEAS level achieving proficiency on the PN CMS Fundamentals assessment for the dichotomized variables.

**Table 2.** Crosstabs of ATI TEAS academic preparedness category by Fundamentals proficiency level (n=30,863)

| <b>PN CMS Fundamentals Proficiency Levels</b> |                   |          |          |          |          |
|---|-------------------|----------|----------|----------|----------|
| <b>ATI TEAS Academic Preparedness Levels</b>  |                   | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> |
| <b>Developmental</b>                          | % within category | 39.5%    | 53.5%    | 6.9%     | 0.2%     |
|   | n                 | 502      | 680      | 87       | 2        |
| <b>Basic</b>                                  | % within category | 12.8%    | 62.0%    | 25.1%    | 0.2%     |
|   | n                 | 1,495    | 7,262    | 2,939    | 21       |
| <b>Proficient</b>                             | % within category | 3.2%     | 40.7%    | 54.4%    | 1.8%     |
|   | n                 | 515      | 6,558    | 8,770    | 290      |
| <b>Advanced</b>                               | % within category | 0.8%     | 14.9%    | 75.6%    | 8.6%     |
|   | n                 | 14       | 252      | 1,279    | 146      |
| <b>Exemplary</b>                              | % within category | 0.0%     | 3.9%     | 54.9%    | 41.2%    |
|   | n                 | 0        | 2        | 28       | 21       |

**Table 3.** Crosstabs of Dichotomized ATI TEAS levels by Dichotomized PN CMS Fundamentals levels (n=30,863)

| <b>PN CMS Fundamentals Proficiency Levels</b> |                   |                      |                          |
|---|-------------------|----------------------|--------------------------|
| <b>ATI TEAS Preparedness</b>                  |                   | <b>Below Level 2</b> | <b>Level 2 and Above</b> |
| <b>Below Proficient</b>                       | % within category | 76.5%                | <b>23.5%</b>             |
|   | n                 | 9,939                | <b>3,049</b>             |
| <b>Proficient and Above</b>                   | % within category | <b>41.1%</b>         | <b>58.9%</b>             |
|   | n                 | <b>7,341</b>         | <b>10,534</b>            |

## Conclusion

The magnitude of the correlation between the ATI TEAS and the PN 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 support the use of the ATI TEAS scores as a selection criterion in combination with other variables.

Additionally, the ATI TEAS preparedness level data are a powerful complement to the preparedness level descriptors and provide an enhanced picture of how students at various ability 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 PN 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.