

## RESEARCH BRIEF:

### *Predicting PN Student Attrition using the TEAS V*



Nursing student attrition continues to pose a problem and, when paired with an already understaffed nursing workforce, interventions are urgently needed. Inconsistent measurement of attrition data has historically impeded studying the causes of nursing school attrition. ATI partners with the majority of nursing programs in the United States and, as a result, a product usage based, and broadly applicable, proxy for understanding nursing student attrition is described in this paper. After comparing product usage at the beginning and conclusion of each graduating class, attrition rates were calculated for 2,498 unique PN classes (2009-2011). Of these classes, 879 classes' students were found to have been screened using the TEAS V during pre-admissions testing. Analysis of class level TEAS V data shows that programs with higher TEAS V performance have significantly lower nursing student attrition.

#### INTRODUCTION

It is easy to see the critical consequences of student attrition. Within the healthcare industry, the lack of qualified nursing professionals to meet the needs of society continues to be a concern (Urwin et al., 2010). Attrition within nursing programs, therefore, represents a distressing loss of needed professionals entering the workforce (Gillis, 2007). From this perspective, it is not surprising that the problem of nursing student attrition has received increased attention from state and federal governments (Hirschy et al., 2011).

Confounding efforts by policymakers to stem nursing student attrition, is the fact that not all nursing student attrition is preventable. A host of factors contribute to student attrition. Not all reasons for attrition are based on academic preparedness or academic performance. Personal, familial, and financial constraints represent a largely uncontrollable source of student dropout and are frequently cited when attempting to understand the main reasons for students' attrition decisions. As a result, sources of attrition can be understood in terms of being either *controllable* or *uncontrollable*.

Opportunities to take action on controllable sources of attrition exist during the career of

any nursing student. Decisions regarding admissions as well as strategies to keep students involved in learning all influence the likelihood of student attrition. To that end, Assessment Technologies Institute® (ATI) has created the *Test of Essential Academic Skills* (TEAS). Currently in its fifth version, the TEAS V is designed to be one part of a comprehensive admissions system used to effectively identify applicants with the foundational knowledge required for success early in a nursing school's program.

Although the TEAS has previously been shown to significantly predict 1<sup>st</sup> year nursing student academic performance (e.g., Wolkowitz & Kelley, 2011), no study to date has examined the effectiveness of TEAS V at predicting student attrition. The purpose of this paper is to explore the TEAS V's ability to mitigate nursing student attrition. It is hypothesized that programs with higher average TEAS V performance (i.e., programs having more academically prepared applicants) benefit from lower observed rates of student attrition. The following sections of this paper outline the relevant research methods and findings associated with this hypothesis and conclude with a discussion of the utility of the TEAS V as part of any nursing program's comprehensive admissions process.

## RESEARCH DESIGN

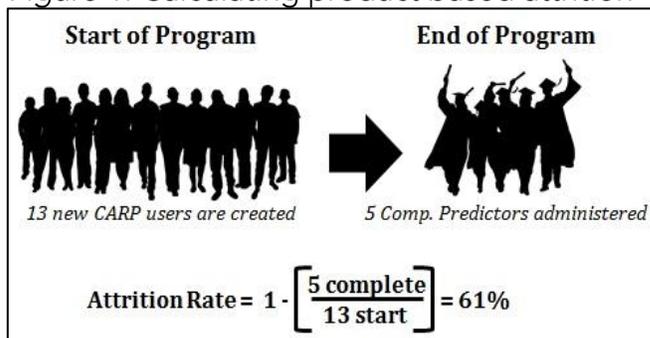
### *Identifying a Consistent Attrition Metric*

Despite a widespread call to action regarding nursing student attrition, there are fundamental methodological problems associated with the study and measurement of attrition (Deary et al., 2003; Glossop, 2001). As Cook (2010) noted, the lack of a common method for calculating attrition across programs makes it difficult to analyze attrition throughout higher education. Due to the inconsistencies across programs with regard to calculating and reporting student attrition, ATI proposes a way to calculate attrition rates based on its student product usage metrics.

Although ATI's products are used in nursing programs throughout the United States, attrition rates could only be calculated for a subset of programs using a specific combination of products. Attrition rates were only calculated for programs with graduating classes using ATI's *Comprehensive Assessment and Review Program* (CARP). The CARP product offers a unique insight into student attrition due to its inclusion and usage throughout the duration of a nursing student's academic career. For example, at the beginning of any nursing program cohort (i.e., class), a set number of users are granted access to the CARP content. Furthermore, at the conclusion of a nursing program, any remaining students within the CARP using cohort are granted access to ATI's *Comprehensive Predictor* assessment. The CARP product, and its associated *Comprehensive Predictor* assessment, are therefore able to serve as an effective proxy to starting and ending class sizes for any given academic cohort (see Figure 1). Given class level tallies of nursing students at the beginning and conclusion of a specific cohort, it requires only simple arithmetic to

*ATI proposes a way to calculate attrition rates based on its student product usage metrics*

Figure 1. Calculating product based attrition



calculate student attrition rates at the class level.

### *Interpreting the TEAS V at the Class level*

Based on specific research procedures as well as guidance received from 17 experienced nurse educators, performance based academic preparedness categories for the TEAS V have previously been identified (see *Test of Essential Academic Skills V – Standard Setting Study Report* for greater detail). These academic performance categories categorize students' TEAS V scores into 1 of 5 groups (see Figure 2).

The TEAS V is designed as a student level assessment of academic preparedness. When examining TEAS V scores at a class level, individual classes can be similarly categorized as being comprised of, on average, students scoring within specific categories of preparedness. For example, if across the 18 students in a given class, the average TEAS V score was 62.5%, the class, on average, can be categorized in the TEAS V proficient category.

Figure 2. TEAS V Preparedness Categories

TEAS V Proctored Assessment	
Preparedness Category	Score Range
Developmental	< 41.3%
Basic	> 41.2% & < 58.7%
Proficient	> 58.6% & < 78.0%
Advanced	> 77.9% & < 90.7%
Exemplary	> 90.6%

### Study Inclusion Criteria & Plan of Analysis

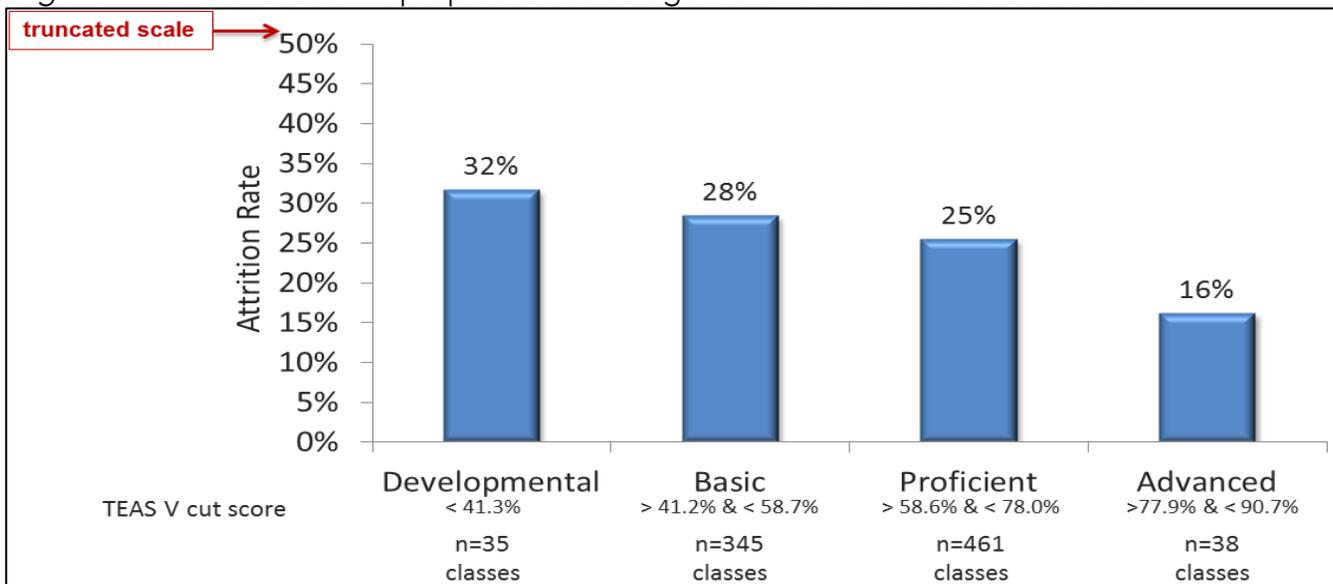
The cut scores identified by the TEAS V National Standard Setting Study were used to categorize average class TEAS V performance. As any individual student's score might drastically influence the average of a small cohort's TEAS V performance, only classes with a minimum of 5 students having valid TEAS V scores were considered for this study. Depending on the institution, however, students may be allowed to re-test on the TEAS V (Wolkowitz, 2011). Since any admissions decision is likely to be heavily based on a student's most recent TEAS V score, only this score was considered for analysis. All TEAS V scores were aggregated to the class level, by institution, and matched with their respective attrition statistics. As the TEAS V was released in November of 2009, product usage and attrition comparisons were only made for the calendar years 2009 – 2011. Due to the categorical nature of the predictor variable (i.e., TEAS V cut score groupings), an analysis of variance (ANOVA) was deemed the most appropriate statistical procedure to examine differences in class attrition rates.

*For every 10 point increase in an average class' TEAS V score, a resulting 3% reduction in attrition can be expected*

### Results

Statistical analysis of 879 unique PN classes uncovered a significant relationship between average class TEAS V score and class level attrition rates ( $F(3,875) = 5.892, p < .001$ ). To help better understand the direction and magnitude of this statistical relationship, it has been depicted in Figure 3. After including only those classes that met our inclusion criteria, no class had a mean score falling in the TEAS V Exemplary category. Despite this limitation, attrition clearly decreases as TEAS V scores increase. As would be expected, the majority of classes have average student TEAS V scores that fall in the Basic ( $n=345$ ) or Proficient ( $n=461$ ) categories, whereas relatively few classes have average student scores in the Developmental or Advanced categories. A follow-up regression analysis found a statistically significant linear relationship between average class TEAS V score and class attrition rate ( $R^2 = .03, p < .001$ ). Although the effect size value of 0.03 indicates a small effect size, statistical models utilizing regression beta weights indicate that for every 10 point increase in an average class' TEAS V score, a resulting 3% reduction in attrition can be expected.

Figure 3. TEAS V academic preparedness categories and calculated attrition rate



## CONCLUSION

Nursing student attrition will likely remain a problem for many years to come. Unfortunately, compounding the difficulty of addressing nursing student attrition is the lack of a consistently used attrition metric. This paper outlines how a vendor like ATI can offer consistent insights into classes' attrition rates. In particular, users of ATI's CARP and its associated *Comprehensive Predictor* assessment, can use this methodology to compare their attrition rate against like programs. Additionally, this paper demonstrates that programs with higher average TEAS V performance benefit from lower observed rates of student attrition.

As this paper's analyses and findings are reflective of institutions with a CARP and TEAS V usage combination, it is likely that student attrition rates reported here are lower than at institutions not using similar products that support either the admissions or curricular design. This suppression of attrition rates is reasonable to assume given that the programs studied in this paper benefit from the presence of CARP study aids as well as TEAS V applicant screening. As a result, the positive findings described in this paper are likely a muted version of a relationship where programs shift to methods of student support comparable to what ATI offers.

When one considers the myriad of controllable and uncontrollable reasons for nursing student attrition, it is highly impressive that meaningful reductions in student attrition can be achieved through the integration of TEAS V into a comprehensive applicant screening process. ATI is dedicated to developing tools and solutions that help schools prepare the next generation of nursing leaders. We are proud to contribute to reducing nursing student attrition and we will continue to seek out ways to improve student experiences during their nursing school careers. Although this paper's

findings strongly support TEAS V's importance during the admissions process, other important factors (e.g., GPA and applied experiences) are also likely to be predictive of nursing school success. As a result, ATI does not suggest that the TEAS V be used as the sole criterion for admissions decisions.

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