

## What effect does taking remedial coursework have on on-time Associate Degree completion?

Ultimately, the goal of remedial coursework increase the likelihood of student success. The aim of this study is to determine whether or not that goal is currently being achieved.

The data for this study consist of a sample of 2,039 students who graduated from a North Dakota high school between 2008 and 2010 and were enrolled in an NDUS Community College in the fall semester immediately following their high school graduation. 699 of these students undertook some form of remedial coursework, while 1,340 did not have any remedial coursework.

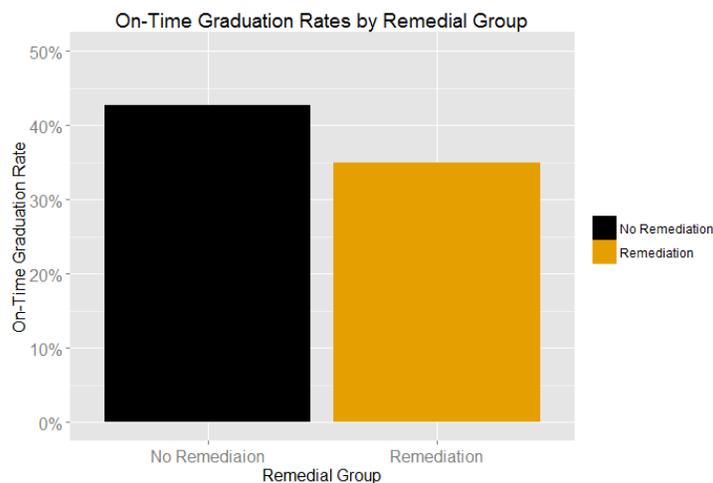


Figure 1: On-Time Graduation Rates by Remedial Status

As can be seen by figure 1, it appears on the surface that students who undertake remedial coursework have a lower on-time graduation rate than non-remedial students. However, the average NDUS Core GPA for the non-remedial group is 2.774, compared to the average NDUS Core GPA for the remedial group of students, which is 2.295. Since NDUS Core GPA has been established as a significant factor for on-time degree completion, it seemed possible that the reason the remedial group has a lower on-time graduation rate than non-remedial students is simply because the group contains far more low GPA students than the non-remedial group. To further study this possibility, students in the remedial group were matched with similar students from the non-remedial group on the basis of NDUS Core GPA. Matching non-remedial students were found for all remedial students. McNemar’s test for related samples was used to determine the effect remediation was having on student success, controlling for GPA.

		Remedial Students	
		On-Time Graduate	Not On-Time Graduate
Matched Non-Remedial Students	On-Time Graduate	88	136
	Not On-Time Graduate	149	313

Table 1: Effects of Remedial Coursework for Matched Students

$p_1$  is defined to be the proportion of students who do not receive remedial coursework and graduate with their Associate Degree within three years of initial enrollment.  $p_2$  is defined to be the proportion of students who do receive remedial coursework and graduate with their Associate Degree within three years of initial enrollment.

$$\hat{p}_1 = \frac{88 + 136}{686} = 32.65\% \quad (1)$$

$$\hat{p}_2 = \frac{88 + 149}{686} = 34.55\% \quad (2)$$

Using McNemar's test:

$H_o : p_1 = p_2$  (The two proportions are the same)

$H_a : p_1 \neq p_2$  (The proportion of successful on-time graduates differs between the groups)

$$z_{test} = \frac{136 - 149}{\sqrt{136 + 149}} = -0.77 \quad (3)$$

$$p = 0.4413 \quad (4)$$

### Interpretation

The results of the McNemar test state the null hypothesis that the two proportions are the same cannot be rejected. Therefore, it cannot be concluded that there is a difference in the proportion of on-time graduates between non-remedial and remedial students with similar GPAs.

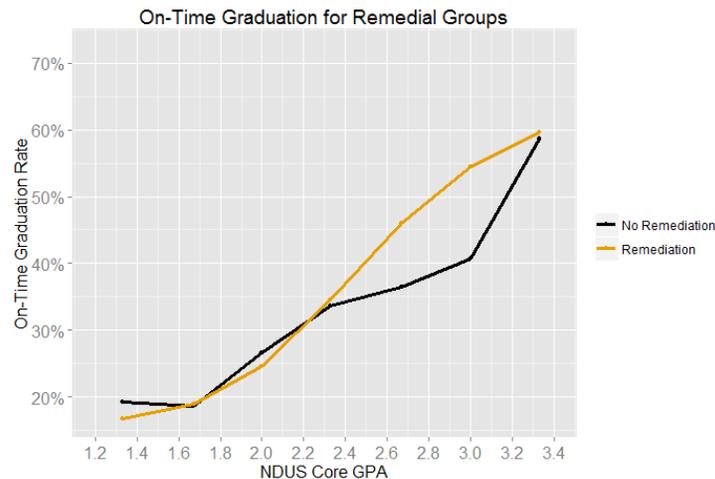


Figure 2: On-Time Graduation Rates by Remedial Status and GPA

While it appears that remedial coursework may have a slightly positive effect on on-time graduation rates. However, this is not a statistically significant difference at this time. With additional data and/or matches for students, this may warrant further study in time.

## Conclusions

### Question 1 - Is GPA or ACT more indicative of student success?

- The four GPA types - School, State, State Core, and NDUS Core - are very similar to each other, and could likely be used interchangeably in any application. Since this was primarily a post-secondary study, NDUS Core GPA was used.
- ACT Composite is not useful in predicting a student successfully completing an Associate Degree in three years.
- NDUS Core GPA is far more correlated with on-time degree completion when compared with ACT Composite, and is significant in predicting on-time Associate Degree completion.

### Question 2 - Does Math Remediation have an effect on success in the first semester of College Algebra? What factors affect success?

- Both NDUS Core GPA and ACT Math are significant predictors of success in the first semester of College Algebra.
- Math Remediation appears to have a detrimental effect if  $ACT_{Math} > 100.941 - 31.453(NDUSCoreGPA)$  for a student.
- A cut score for identifying need for remediation could be established with the above formula. This moves students more likely to be successful from being identified for remediation to non-remedial status while also flagging students less likely to be successful who were previously not taking remedial coursework.

### Question 3 - Does English Remediation have an effect on success in the first semester of English Composition I? What factors affect success?

- NDUS Core GPA is a significant predictor of success in the first semester of English Composition I. ACT English is not significant.
- English remediation appears to have a negative effect on successful completion of English Composition I across all GPA levels. There are possible explanations for this (not limited to these):
  - More factors need to be considered, as an underlying significant common factor within groups of students may be causing an increase or decrease in success.
  - English remediation in its current form is not effective.

### Question 4 - What effect does taking remedial coursework have on on-time Associate Degree completion?

- No statistical difference exists between the on-time Associate Degree completion rates of students who take remedial coursework versus those that do not.