

 THE RESEARCH AGENDA

The First Two Years of College: Predicting Academic Success and Promoting Four-Year Completion

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This study explores how students' initial two years at college influence degree GPA and duration of completion. Results highlight the importance of the first two-year cumulative GPA and credits in forecasting degree outcomes. Early college credits and high school GPA impact success, guiding effective course planning. Implications encompass improved academic advising and collaboration between college and high school counselors. Suggested guidelines for minimum GPA and credits aid timely graduation. Future prospects involve extending the research to diverse institutions and student demographics.

Literature Review

Strategic enrollment management (SEM) has evolved significantly since its inception in the early 1970s. A key purpose of SEM is achieved by promoting students' academic success by improving access, transition, persistence, and graduation (Ingersoll, *et al.* 2012). Student success is a multi-dimensional concept encompassing "academic achievement, satisfaction, acquisition of skills and competencies, persistence, attainment of learning objectives, and career success" (York, *et al.* 2015, 5). Students being capable of graduating within their desired timeframe and eventually achieving career success is the ultimate goal of higher education. A nationwide

survey conducted in 2019 shows 90 percent of 95,505 first-time, full-time freshmen respondents expected to graduate within four years (Stolzenberg, *et al.* 2020). Most high school graduates anticipate completing a bachelor's degree in a four-year period of time. Unfortunately, the average national four-year graduation rate was 40 percent of all four-year institutions in cohort entry year 2013–14 (NCES 2022a). Six-years has become the unquestioning standard measure of how long it takes students to earn a four-year degree for calculating the overall graduation rate (NCES 2022b). Prolonging the duration of undergraduate study places a financial burden on students and their families.

With these enrollment challenges, higher education institutions have become more focused on maintaining optimal enrollment, retention, persistence, and graduation strategies (Gordon and Wankel 2023, 27). It is essential to focus on the SEM Planning Framework (Bontrager and Green 2012) to create a comprehensive data-driven SEM plan for achieving sustainable outcomes. Effective strategies are needed to actively promote four-year degree completion and maximize student success. Existing literature has examined various factors influencing student academic success, including prior academic achievement, student demographics, e-learning activity, psychological attributes, and environmental factors (Alyahyan and Düşteğör 2020). Of these factors, prior academic achievement stands out as the most critical, with a focus on assessing past grades, including high school grade point average (GPA), college semester GPAs, and cumulative grade point averages (CGPAs) (Zwick 2006). These grades, readily available in educational institutions, serve as crucial indicators for measuring student success (Parker, *et al.* 2004).

High school GPA has been well-examined in previous literature as a predictor of academic performance and persistence (Zwick 2006). In a recent meta-analysis (Westrick, *et al.* 2015), Westrick and colleagues evaluated the validity of high school GPA on predicting college performance and their correlation. Interestingly, the college academic performance was measured by the first-year and second-year cumulative GPA. They reported a strong correlation between high school GPA and first two-year GPA ($r=0.62$) and a moderate correlation between high school GPA and first-year GPA ($r=0.58$), suggesting high school GPA is a valid predictor of the first-year and first two-year performances. Meanwhile, the predictive effect of high school GPA on degree GPA has been thoroughly examined (Betts and Morrell 1999; Richardson, *et al.* 2012; Westrick, *et al.* 2015; Zwick and Sklar 2005) and validated. High school GPA has been reported to be strongly linked to degree GPA.

Early stage of college has been another focus of numerous studies to evaluate student success. The GPA from the first semester and the CGPA from both the first and second years are commonly used outcomes,

given their role in academic progression during this pivotal phase. (Krumrei-Mancuso, *et al.* 2013; Permzadian and Credé 2016; Van der Zanden, *et al.* 2018, Westrick, *et al.* 2015). While early college performance can be indicative, it may not fully reflect a student's entire college journey or their potential for success. It is essential to recognize the academic and psychological transition from high school to college. Students typically struggle with self-regulated learning in their first year (Peverly, *et al.* 2003). Most students in their first semester enroll in general education courses, which helps cultivate effective study habits and improves self-regulated learning, subsequently leading to a better academic outcome (Cambridge-Williams, *et al.* 2013; Cleary and Zimmerman 2004; Hendel 2007; Schnell and Doetkott 2003). But they continue to have issues with self-regulated learning and goal-setting beyond their first semester (Thibodeaux, *et al.* 2017). Students often fall short of achieving their intended target GPA in the first semester (Knouse, Feldman, and Blevins 2014), and most university dropouts occur either during the first year or immediately after (Credé and Niehorster 2012). Therefore, the predictive power of first-semester or first-year performance becomes questionable.

Similar considerations extend to the number of college credits earned during high school and in the early stage of college. Since the academic workload significantly influences the pace of progress toward degree completion, the promotion of early course enrollment to its maximum extent (15 credits) is recommended (Attewell and Monaghan 2016). However, considering the varied challenges and adjustments that students often experience during their transition from high school to college life, students still learn to strike a balance in their course load to mitigate potential stress and maintain the quality of their work, which in turn impacts their GPA and risk of dropping out. Therefore, it is crucial to determine the optimal course load not only for the first semester but also during the initial two years, as this is vital for maintaining academic progress and aiding students in effectively overseeing their coursework, enabling them to smoothly advance in their educational endeavors.

While the performance in the high school and the first year of college holds valuable predictive power, integrating data from the first two years may yield a more comprehensive and precise forecast of a student's potential degree GPA and estimated time to completion. In the notion of predicting academic success and promoting four-year graduation, this quantitative study was conducted to 1) explore the relationship between the first-semester, first-year, first two-year GPA and credits (total and credits taken for GPA), and the outcomes, degree GPA and duration of program completion, and 2) determine the appropriate number of credits and the minimal cumulative GPA during the early stage of college for students to graduate on time (within four years).

Methods

This quantitative study utilized descriptive analysis, student t-test, correlation and regression, and receiver operating characteristics (ROC) curve analysis. The main outcomes were the degree GPA and the duration of program completion. The predictors were the first-semester/the first-year/the first two-year GPA and credits (total credits and credits taken for GPA).

Data used in this study was extracted from the university student information system (Peoplesoft, Oracle, CA) and focused on the undergraduate student population who started as a first-year college student from fall 2014 through fall 2018 and completed bachelor's degree at a southern public Hispanic-Serving Institution (HSI). A total number of 564 students were included in the study. Table 1 displays the descriptive data of students' demographic and academic characteristics, including sex, age upon application, ethnic background, marital status, STEM status, high school GPA, degree GPA, GPA predictors and credits predictors. These were further classified based on program completion time into two groups: "within four years (including four years)" and "more than four years." The student t-test was used to compare the differences between groups. Furthermore, a subanalysis was conducted to examine the effect of taking college credits during high school on the duration of program completion.

Bivariate correlation was conducted to examine the correlation between degree GPA and the GPA predictors, and the correlation between the duration of completing the program and the credits predictors. The duration of program completion in this analysis was converted into a continuous variable by converting the number of months of being in school to years. Meanwhile, linear regression was used to determine how much the GPA predictors predict the degree GPA and how much the credits predictors predict the duration of degree completion.

Lastly, the area under the receiver operating characteristics (ROC) curve analysis for graduating "within four years" versus "more than four years" was performed to determine the minimum cumulative GPA within the first two years of college for achieving a four-year graduation, separated by the status of taking college credits during high school. All statistical analyses were carried out in SPSS (version 29), with a significance level set at 0.05.

Results

The students' characteristics are shown in Table 1 (on page 6). The data shows 64 percent of first-time, undergraduate students completed a four-year bachelor's degree within four years, with 66 percent female and 34 percent male. The percentage of students being "single" from the "within four years" group was higher than the group of "more than four years" (52 vs. 48 percent). The percentage of students who took college credits in high school from "within four years" doubled that from "more than four years" (64 vs. 32 percent). Notably, the average number of high school college credits did not significantly differ between groups, with averages of 10.6 and 10.3, respectively. And no significant group difference was found for ethnicity or STEM program status.

As for college performance, groups "within four years" and "more than four years" differ significantly on GPAs and credits. Students who graduated within four years had higher high school GPAs, first-semester GPAs, first-year cumulative GPAs, first two-year cumulative GPAs, and degree GPAs than student who graduated over four years. Also, students who graduated within four years took more credits for GPA in the first year and the first

TABLE 1 ► Student Demographic and Academic Characteristics
by the Duration of Degree Completion

	Within 4 Years		Greater Than 4 Years	
	n	%	n	%
Sample Size	361	64	203	36
Gender				
Female	240	66	122	60
Male	121	34	81	40
Age ¹	18.1 ± 0.4	–	18.1 ± 0.4	–
Ethnicity				
African American	20	6	19	9
Latino	132	37	76	37
Asian	48	13	28	14
White	159	44	82	40
Native American	2.0	0.1	2.0	0.1
Marital Status				
Single	186	52	95	48
Married or Unknown	175	48	108	52
Stem Program Status				
Yes	187	52	109	54
No	174	48	94	46
Take College Credits in High School				
Yes	231	64	64	32
No	130	36	142	68
GPA ^{1,2}				
High School GPA	3.61 ± 0.03	–	3.44 ± 0.03	–
First-Semester GPA	3.27 ± 0.04	–	2.87 ± 0.05	–
First-Year Cumulative GPA	3.30 ± 0.03	–	2.93 ± 0.04	–
First 2-Year Cumulative GPA	3.36 ± 0.03	–	2.99 ± 0.03	–
GPA Upon Graduation	3.43 ± 0.02	–	3.13 ± 0.03	–
Credits				
First 2-Year Total Credits ²	57.7 ± 0.5	–	54.3 ± 0.6	–
First-Year Total Credits	28.3 ± 0.3	–	27.7 ± 0.3	–
First-Semester Total Credits	13.1 ± 0.1	–	13.3 ± 0.2	–
First 2-Year Credits Taken for GPA ²	55.4 ± 0.5	–	49.5 ± 0.7	–
First-Year Credits Taken for GPA ²	27.1 ± 0.3	–	25.4 ± 0.4	–
First-Semester Credits Taken for GPA	13.1 ± 0.1	–	13.2 ± 0.2	–

¹ Values shown indicate mean ± standard error² Statistically significant difference between groups

two years, and more total credits in the first two years than those who graduated over four years. No statistically significant difference was observed for the first-semester

credits or first-year total credits (Table 1). Furthermore, the subanalyses on early college credit status yielded similar results (*see* Tables 2 and 3, on page 7).

Table 4 (on page 9) presents the results of the correlation analysis on GPAs. It revealed a very strong correlation between degree GPA and the first two-year cumulative GPA ($r=0.905$, $p<0.001$), and a strong correlation between degree GPA and the first-semester GPA ($r=0.658$, $p<0.001$) and the first-year GPA ($r=0.757$, $p<0.001$). A weak but significant correlation was observed between degree GPA and high school GPA ($r=0.284$, $p=0.035$).

Table 5 (on page 9) presents the results of correlation analysis on degree GPA, duration of degree completion, and credits taken in the first two years of college. A weak negative correlation was observed between the degree GPA and the duration ($r=-0.35$, $p<0.001$). Weak to very weak correlations were observed between degree GPA and credits, and weak to negligible correlations were found between duration and credits in the first two years. When separating the students by early credits, a similar pattern was found.

The linear regression suggested that the first two-year cumulative GPA strongly predicted the degree GPA ($R^2=0.818$, $p<0.001$). With a 0.77-point increase in the first two-year cumulative GPA, the degree GPA increases by one point. Both the first-semester GPA ($R^2=0.433$, $p<0.001$) and the first-year cumulative GPA ($R^2=0.573$, $p<0.001$) significantly predicted the degree GPA but were not as strong as the first two-year cumulative GPA. Meanwhile, the first two-year credits taken for GPA had the highest predictive power on duration among all predictors on credits taken during college. With a three-credit increase in the first two-year credits taken for GPA, the duration for completion will decrease by one semester, when students take at least thirteen credits per semester (fall/spring semester) in the first two years. The first-year

TABLE 2 ► Academic Performances for Students With Early College Credits¹

	Within 4 Years	Greater Than 4 Years
Sample Size	231	64
College Credits Taken During HS ²	10.6 ± 0.7	10.3 ± 0.8
GPAs ²		
High School GPA	3.64 ± 0.03	3.52 ± 0.04
First-Semester GPA ³	3.24 ± 0.05	2.89 ± 0.10
First-Year GPA ³	3.26 ± 0.04	2.94 ± 0.07
First 2-Year GPA ³	3.33 ± 0.04	2.98 ± 0.06
GPA Upon Graduation ³	3.42 ± 0.03	3.08 ± 0.05
Credits ²		
First 2-Year Total Credits ³	56.1 ± 0.6	52.2 ± 1.2
First-Year Total Credits ³	27.7 ± 0.4	26.6 ± 0.7
First-Semester Total Credits	12.7 ± 0.2	12.6 ± 0.3
First 2-Year Credits Taken for GPA ³	53.2 ± 0.7	46.3 ± 1.4
First-Year Credits Taken for GPA ³	26.2 ± 0.4	24.1 ± 0.8
First-Semester Credits Taken for GPA	13.8 ± 0.2	13.5 ± 0.2

¹ Freshman Level < 30 credits

² Values shown indicate mean ± standard error

³ Statistically significant difference between groups

TABLE 3 ► Academic Performances for Students Without Early College Credits

	Within 4 Years	Greater Than 4 Years
Sample Size	130	139
GPAs ^{1,2}		
High School GPA	3.56 ± 0.06	3.39 ± 0.04
First-Semester GPA	3.31 ± 0.06	2.86 ± 0.06
First-Year GPA	3.38 ± 0.04	2.93 ± 0.05
First 2-Year GPA	3.42 ± 0.04	2.99 ± 0.04
GPA Upon Graduation	3.47 ± 0.03	3.15 ± 0.03
Credits ¹		
First 2-Year Total Credits ²	60.6 ± 0.9	55.3 ± 0.6
First-Year Total Credits	29.3 ± 0.5	28.7 ± 0.5
First-Semester Total Credits	13.8 ± 0.2	13.5 ± 0.2
First 2-Year Credits Taken for GPA ²	58.7 ± 0.9	50.8 ± 0.7
First-Year Credits Taken for GPA ²	28.7 ± 0.5	25.9 ± 0.4
First-Semester Credits Taken for GPA	13.8 ± 0.2	13.5 ± 0.2

¹ Values shown indicate mean ± standard error

² Statistically significant difference between groups

credits taken for GPA significantly predicted the duration ($R^2=0.04$, $p<0.001$) but were not as strong as the

first two-year credits taken for GPA. No significance was observed for the first-semester credits taken for GPA. The high school GPA also significantly predicted the degree GPA ($R^2=0.08$, $p=0.032$), but the predictive power was the lowest among other GPA variables.

Based on the predictive effects from the correlation and regression analyses, ROC analyses (*see* Table 6, on page 9) suggested that students who never took college credits during high school should aim for a minimum of 54 credits for GPA and maintain a cumulative GPA of 3.11 within the first two years of college, along with a minimum of 27 credits for GPA and maintain a cumulative GPA of 3.0 within the first year of college. For students who had college credits taken during high school, it suggested taking a minimum of 50 credits for GPA and maintaining a cumulative GPA of 3.11 within the first two years and taking a minimum of 25 credits for GPA and maintaining a cumulative GPA of 2.83 within the first year.

Discussion

The purpose of this study was to examine the impact of the first two years of performance in college on overall college performance, including degree GPA and duration of degree completion. It showed that the first two-year cumulative GPA and credits taken for GPA were the most accurate benchmarks to predict degree GPA and the duration of four-year program completion. Also, the status of taking college credits in high school plays a role in promoting degree completion.

First Two-Year Cumulative GPA and Credits Taken for GPA

The findings align with previous research (Adekitan and Salau 2019; Asif, *et al.* 2017; Asif, Merceron, and Pathan 2014; Putpuek, *et al.* 2018), which explores the prediction of academic success at the degree level. These studies, which examined various data mining techniques, consistently demonstrate that incorporating grades from the first two years of a program improves predictive accuracy compared to relying solely on demographic data (Putpuek, *et al.* 2018). Regarding the predictive effect of GPA, the results indicate that both first-year and first

two-year GPAs significantly forecast degree GPA. Additionally, the credits taken for GPA during the first two years emerge as the most influential predictor for estimating the duration of degree completion among credit-related variables. Specifically, credits taken for GPA per semester, indicative of progress toward graduation, are pivotal determinants of academic pace, ultimately shaping the projected duration of degree completion.

Therefore, communicating the importance of the first two years' performance in the very beginning of the academic journey becomes crucial. Students facing GPA challenges or course difficulties in the first year may experience stress, amid the growing concerns over college students' mental health. Acknowledging that the initial college year involves transition while the second year provides a more stable view of their abilities, academic advisors can alleviate stress and guide students through academic challenges like course selection, major choice, and career decisions. Analyzing a student's first two-year cumulative GPA and credits taken for GPA enables advisors to offer targeted guidance to students who might be struggling, while it remains early enough for them to improve their overall GPA. This proactive approach can positively impact retention rates and overall academic success. On the other hand, high-achieving students in their first two years can strategically plan coursework with confidence in their strong academic foundation, optimizing course selection and time management to achieve a higher degree GPA and fostering a focus on academics. In addition, many degree programs gradually increase coursework complexity, with the second year often featuring specialized major-related courses that provide insights into a student's field of interest. Evaluating performance over the first two years captures foundational knowledge and progress before students delve into specialized major courses, helping to account for variations in difficulty and subject matter that may arise in the first year.

High School GPA and College Readiness

Although the researchers observed only weak correlations between high school GPA and college performances (first-semester, first-year, second-year, and

TABLE 4 ► Bivariate Correlation of GPAs

	High School GPA	First-Semester GPA	First-Year GPA	First 2-Year GPA
Degree GPA	0.284 ^a	0.658 ^a	0.757 ^a	0.905 ^a
High School GPA	1.000	0.351 ^a	0.364 ^a	0.308 ^a
First-Semester GPA		1.000	0.765 ^a	0.735 ^a
First-Year GPA			1.000	0.868 ^a
First 2-Year GPA				1.000

^a Statistically significant**TABLE 5 ► Bivariate Correlation of Duration of Degree Completion, Degree GPA, and Credits**

	Duration	Total Credits			Credits Taken for GPA		
		First 2-Year	First Year	First Semester	First 2-Year	First Year	First Semester
Degree GPA	-0.351 ^a	0.095	0.141 ^a	0.095 ^a	0.351 ^a	0.206 ^a	0.190 ^a
Duration	1.000	-0.235 ^a	-0.116	-0.018	-0.350 ^a	-0.213 ^a	-0.045

^a Statistically significant**TABLE 6 ► Recommendations of Minimal Credits Taken for GPA and Cumulative GPA Within the First Two Years of College to Graduate Within Four Years**

	Credits Taken for GPA		Minimal GPA	
	Year 1	Year 2	Year 1	Year 2
Without College Credits	27	54	3.00	3.11
With College Credits	25	50	2.83	3.11

degree GPA), high school GPA differed significantly between the student group who finished the degree within four years and more than four years. The students who completed within four years had a significantly higher high school GPA than those completed over four years among students who never had early college credits during high school (3.56 vs. 3.39). Interestingly, the difference disappeared in the students who took early college classes during high school. This could be due to the higher motivation of those students, leading to a more strategic and effective planning of their college academic path.

In addition, earning college-level credits during high school and applying them toward college graduation accelerates student learning and enhances graduation rates. These courses prepare students for college-level work and help them clarify their interests and career

goals (Myers and Myers 2017). These findings reveal that a significant majority (78%) of students who earned an average of ten college credits during high school tend to graduate within the standard four-year timeframe and achieve higher GPAs across all relevant metrics (see Table 2). This aligns with previous research indicating a positive correlation between accelerated college credits and reduced time to degree completion (Perkins 2022). Notably, both early college credit takers and non-takers benefit from higher first two-year GPAs and more credits taken for GPA (Table 2 and 3) when graduating within four years, underscoring the importance of early academic success during college. In light of these findings, a collaborative effort among high school counselors, college counselors, and advisors to encourage high school students (potential college students) to pursue early college credits is advisable.

Recommended Minimum GPA and Credits in the First Two Years

This study recommends a minimum of 12.5 credits per semester for students with early credits and at least 13.5 credits per semester within the first two years (on a four-semester basis) to achieve a four-year graduation. This can be achieved by taking one to two additional courses during summer. A previous study, using nationally-representative data and propensity-score matching methods to reduce selection bias found that taking fifteen credits instead of twelve in the first semester improves the odds of graduating within six years (Attewell and Monaghan 2016). In this sample, students averaged thirteen credits in the first semester, which is slightly lower than the referenced study. However, considering the transition phase in the first semester and the need for students to gradually adapt and reflect on their learning strategies and challenges during the first two years, this approach promotes balanced well-being and sustainable learning habits. Academic advisors, who understand students' needs and interests, are pivotal in facilitating their integration into college life and ensuring successful degree completion, with a focus on the first two-year performance rather than just the first semester or year."

Students with prior college course experience demonstrate advantages in both first year and first two-year GPAs as well as credit accumulation. Specifically, those with early college credits (mean = 10) require two fewer credits in the first year and four fewer credits in the first two years compared to their counterparts without such credits. Additionally, the minimum first-year GPA requirement may be lower for students with early college credits (GPA: 2.83 vs. 3.0). Nevertheless, it is important to note that, regardless of early college

credit status, a consistent first two-year GPA requirement of 3.1 is upheld. This underscores the advantage of early college credits in facilitating on-time degree completion while emphasizing the need for sustained academic progress to graduate within the standard four-year timeframe.

Implications Future Research

Due to the limited study population, further study is warranted to ensure the validity and reliability of the current findings. Generalizing these findings across a broader spectrum of institutions would be highly beneficial. Replicating this study at diverse institutions, including community colleges and four-year institutions with varying levels of selectivity, is essential to validate the outcomes of the present research. Additional information could emerge from different student groups, such as students' socioeconomic status, first-generation and non-traditional students, and students from various majors.

Conclusion

This study presents a clear set of guidelines for promoting a four-year graduation rate. The first two-year cumulative GPA and credits taken for GPA were found to be the most accurate predictors of degree GPA and duration of degree completion. Enrollment management professionals should review their data to determine if further implementation is warranted. By implementing these guidelines, universities could take prompt actions in the early stages to achieve enrollment goals. College advisors could also use these data as an impetus to identify students who are at risk and facing academic difficulties. Gaining deeper insights into the motivational and academic factors that contribute to the first two-year GPA and credits ensures students' long-term success.

AUTHOR NOTE

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