

Office of Institutional Effectiveness

Analysis of Factors Influencing Time to Degree of Baccalaureate Degree Recipients Academic Years 2005-06 to 2010-11

SUMMARY REPORT

VISION

We seek to become recognized for providing bright and curious students a holistic learning experience that occurs both in and out of the classroom; for being relentlessly focused on learning outcomes; for embracing and solving today's greatest educational challenges; and for bringing fresh and pragmatic thinking to the problems facing communities, businesses, and governments in Indiana and beyond.



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Analysis of Factors Influencing Time to Degree of Baccalaureate Degree Recipients Academic Years 2005-06 to 2010-11

Summary Report

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Office of Institutional Effectiveness Ball State University September 2012 OIE No. TTD-S2-2012

EXECUTIVE SUMMARY

- In the Summer of 2012, the Office of Institutional Effectiveness conducted a study investigating factors related to time to degree of baccalaureate degree recipients who graduated between academic years 2005-06 and 2010-11.
 - Graduating students were studied in terms of their demographic and pre-college education characteristics, financial aid dependency status, enrollment behaviors, and academic outcomes.
 - The study focused on the non-transfer-in population since there were substantial differences found between transfer and 'native' students.
 - Median semesters of enrollment to degree (including summers) for the population was 10. Median semesters elapsed (including "stop out" semesters) from matriculation to graduation was 12.
 - Similar to previous studies analyzing time to degree, the most significant predictors for the semesters enrolled-to-degree completion model included:
 - Average credit hours of enrollment per semester, total credits hours at graduation, number of withdrawn courses, number of failing or non-complete grades, and transfer credit hours.
 - The most significant predictors for time to degree in the semesters elapsed-to-degree model included:
 - Total credit hours at graduation, average credit hours of enrollment per semester, number of failing or non-complete grades, number of major changes, and number of withdrawn courses.
 - Far and away, the average credit hours completed per semester and total credit hours at graduation are the strongest predictors of more rapid degree completion.
 - This is of importance here given the large number of covariates included in the study.
 - Across both models, many other predictors (e.g., number of courses students failed or withdrew from; number of times students changed majors; and being dependent in terms of financial aid status) were statistically significant but had very low effect sizes.

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Analysis of Factors Influencing Time to Degree of Baccalaureate Degree Recipients Academic Years 2005-06 to 2010-11

Introduction

In the Summer of 2012, the Office of Institutional Effectiveness conducted a study investigating factors related to time to degree of baccalaureate degree recipients who graduated between academic years 2005-06 and 2010-11. The purpose of this study is to better understand effects upon time-to-degree attainment for students at Ball State University. Graduating students were studied in terms of their demographic and pre-college education characteristics, financial aid dependency status, enrollment behaviors, and academic outcomes impacting time to degree, measured in the number of semesters enrolled and number of semesters elapsed at the University.

Methodology

The study examines influences upon time to degree for students earning baccalaureate degrees. Data were drawn from historical course, student, degrees conferred, and financial aid files. A total of 15,976 undergraduate students were included in this study on the basis of their completing a baccalaureate degree in the academic years between 2005-06 and 2010-11. Students who transferred into Ball State at any time in their undergraduate careers were excluded from the analysis because these students' transfer-in credits and number of semesters enrolled at Ball State were found to be substantially different than those of students who enrolled initially and persisted to graduation.

For each graduating class, the same demographic, academic, financial aid, and enrollment behavior variables were drawn from institutional data sources. Gender and race information were the primary demographic variables. High school GPA and SAT scores were used as measures of pre-collegiate academic performance. Students' enrollment behaviors were characterized by the major area of their degree(s) awarded, number of withdrawn courses, number of failing or noncomplete grade courses, number of repeated courses, number of semesters living in on-campus housing, and number of major changes. This study accounts for certain academic outcomes by including variables measuring average credit load per semester, total credit hours completed at graduation, and number of degrees and minors conferred.

Table 1 provides the operational definitions of the above mentioned variables. All variables described in this report were statistically significant at the p < .05 level, unless otherwise noted.

Variable	Description
Demographic and Pre-College Education Vari	ables
High School Grade Point Average	
Total SAT	
Gender	Dummy-Coded as Women=1, Men=0
Student of Color	Dummy-Coded as African- American, Asian, Hispanic, Pacific Islander, and Native American as 1, White=0
Transfer Credit Hours	Student Credit Hours Earned by Advanced Placement, College Level Examination Program, Dual High School and College Enrollment, or Enrollment at Another Institution
Enrollment Behaviors	
Major Area: CAP	Dummy-Coded as Yes=1, No=0
Major Area: CAST	Dummy-Coded as Yes=1, No=0
Major Area: CCIM	Dummy-Coded as Yes=1, No=0
Major Area: CFA	Dummy-Coded as Yes=1, No=0
Major Area: Interdepartmental	Dummy-Coded as Yes=1, No=0
Major Area: MCOB	Dummy-Coded as Yes=1, No=0
Major Area: IC	Dummy-Coded as Yes=1, No=0
Note: CSH serves as reference value.	
Number of Majors at Graduation Number of Minors at Graduation	
Number of Courses from Which the Student Withdrew	
Number of Courses the Student Failed	
Number of Courses the Student Repeated	
Number of Audited Courses	
Number of Major Changes	
Number of Semesters Living	
in On-Campus Housing	
Financial Aid	
Financial Aid Dependent Status	1=Dependent, 0=Independent
Academic Outcomes	
Average Student Credit Hours per Semester	
Total Credit Hours Earned at Graduation	
Number of Majors	
Number of Minors	

Table 1: Research Variables Used in Models

Detailed Findings

Characteristics of the Population

Fifty-five percent of the population was female, and 11% were students of color. The average high school grade point average for the population was 3.28, and average total SAT score was 1050.

For the purposes of this analysis, students' major areas of study were grouped into colleges within the University. About 16% of the students graduated from programs in the College of Applied Sciences and Technology; 5% from the College of Architecture and Planning; 11% from the College of Communication, Information, and Media; 6% from the College of Fine Arts; 29% from the College of Sciences and Humanities; 14% from the Miller College of Business; 9% from Teachers College; and 11% from interdepartmental programs.

About 15% of the students graduated with more than one major, and over 60% of students earned at least one minor. More than 40% of students repeated at least one course, 1% audited at least one course, 62% withdrew from at least one course, and about 40% of the population received at least one failing or non-complete grade.

Median semesters of enrollment to degree (including summers) for the population was 10. Median semesters elapsed (including "stop out" semesters) from matriculation to graduation was 12. In order to provide a comprehensive picture of the University's time-to-degree outcomes, three figures were produced to show different views of time-to-degree completion. Figure 1 shows the number of students by number of semesters completed and median cumulative credit hours at graduation. Figure 2 reports the number of students by median cumulative credits and median semesters completed at graduation. Figure 3 indicates the number of students by number of years enrolled. Median number of semesters enrolled to degree and semesters elapsed to degree by college and department is show in Table 2.

Transfer students (N=3,843) were excluded from the population; the remaining 15,976 students constituted the population for the remainder of the analyses. Transfer students were excluded since significant differences between transfer and 'native' students were found in total semesters enrolled to degree and elapsed to degree (8 semesters enrolled for transfer students vs. 10 for native students, and 9 semesters elapsed for transfer students vs. 12 for native students).

A detailed disaggregation of the characteristics of the population can be found in Table 3.

Figure 1: Number of Ball State University Students by Number of Semesters Completed and Median Cumulative Credits at Graduation (AY2005-06 to AY2010-11)



Figure 2: Number of Ball State University Students by Median Cumulative Credits and Median Semesters Completed at Graduation (AY2005-06 to AY2010-11)



Figure 3: Number of Ball State University Students by Number of Years Enrolled at Graduation (AY2005-06 to AY2010-11)



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		Median	Median				
	Number	Semesters	Semesters				
College and Department	of Students	Enrolled	Elapsed				
College of Applied Sciences and Technology							
Family & Consumer Sciences	842	10.0	12.0				
Industry & Technology	356	10.0	12.0				
School of Nursing	617	10.0	12.0				
School of Physical Education	716	10.0	12.0				
College of Architecture and Planning	2						
Architecture	520	10.0	12.0				
Landscape Architecture	141	12.0	15.0				
Urban Planning	92	10.0	12.0				
College of Communication, Informat	tion, and Media	10.0	12.0				
Communication Studies	222	10.0	12.0				
Journalism	122	10.0	12.0				
Telecommunications	8/1	10.0	12.0				
College of Fine Arts							
Art	415	10.0	12.0				
School of Music	247	10.0	12.0				
Theatre & Dance	295	9.0	12.0				
College of Sciences and Humanities							
Anthropology	75	10.0	12.0				
Biology	514	10.0	12.0				
Chemistry	188	10.0	12.0				
Computer Science	77	10.0	12.0				
Criminal Justice & Criminology	579	10.0	12.0				
English	339	10.0	12.0				
Geography	162	10.0	12.0				
Geology	29	11.0	12.0				
History	265	10.0	12.0				
Interdepartmental-CSH	115	11.0	15.0				
Mathematical Sciences	170	9.0	12.0				
Modern Languages & Classics	337	10.0	12.0				
Philosophy	91	9.0	12.0				
Physics & Astronomy	40	10.5	12.0				
Physiology & Health Science	195	11.0	15.0				
Political Science	172	9.0	12.0				
Psychological Science	579	9.0	12.0				
Social Work	181	9.0	12.0				
Sociology	156	10.0	12.0				

		Median	Median
	Number	Semesters	Semesters
College and Department	of Students	Enrolled	Elapsed
College of Sciences and Humanities			
(cont.)			
Speech Pathology & Audio.	226	9.0	12.0
Nat. Res. & Env. Mgt.	80	10.0	12.0
<u>Interdepartmental</u>	1724	9.0	15.0
Miller College of Business			
Accounting	400	10.0	12.0
Economics	90	9.0	12.0
Finance & Insurance	358	10.0	12.0
Info. Systems & Operations Mgt.	225	10.0	12.0
Interdepartmental-MCOB	463	10.0	12.0
Marketing & Management	647	10.0	12.0
Teachers College			
Educational Studies	7	10.0	15.0
Elementary Education	1115	10.0	12.0
Interdepartmental-TC	147	10.0	12.0
Special Education	174	10.0	12.0

Table 2: Median Semesters Enrolled and Elapsed by College and Department (cont.)

		Percent				Percent
Vaniable	λī	of Total		Variable	λī	of Total
Total Dopulation Size	15076	10			IV	IN
A V2005 06	2051			CAST	2521	15 9
A Y 2005-00	2951	18.5		CAD	2551	15.8
AY2006-07	2877	18.0		CAP	/53	4./
AY2007-08	2657	16.6		CCIM	1815	11.4
AY2008-09	2394	15.0		CFA	957	6.0
AY2009-10	2483	15.5		CSH	4570	28.6
AY2010-11	2614	16.4		Interdept.	1724	10.8
Gender				MCOB	2183	13.7
Men	7134	44.7		TC	1443	9.0
Women	8842	55.3		Financial Aid Status		
Ethnicity				Dependent	12927	80.9
Student of Color	1809	11.3		Independent	1263	7.9
White	14167	88.7		Unknown	1786	11.2
	11107		Std		1100	1112
Variable	Ν	Mean	Dev			
High School GPA	15976	3.28	0.42			
Total SAT	15976	1049.59	116.8			
Transfer Hours	15976	3.23	9.86			
Advanced Standing						
Credit Hours	15976	3.38	5.95			
Average						
SCH/Semester	15976	13.92	2.47			
Total SCH	15976	139.29	17.38			
Number of Majors	15976	1.17	0.42			
Number of Minors	15976	1.03	1.07			
Number of						
Withdrawn Courses	15976	1.69	2.43			
Number of						
Failed Courses	15976	1.12	2.28			
Number of						
Repeated Courses	15976	1.03	1.88			
Number of						
Audited Courses	15976	0.02	0.17			
Number of						
Major Changes	15976	1.60	1.24			
Number of Semesters						
Living in						
On-Campus Housing	15976	3.5	2.57			

Table 3: Descriptive Statistics of Independent Variables Used in Models

Analytical Approach

The underlying theoretical framework for the study was the college-students impact model typified by Astin (1970), Pascarella (1985), Tinto (1975, 1987), and Weidman (1989). Total elapsed semesters-to-degree attainment and total semesters enrolled served as dependent variables in two separate analyses. The influence of categories of predictor variables (student demographic and pre-college educational characteristics, enrollment behaviors, financial aid, and academic outcomes) upon the dependent variables were tested using the SPSS Linear Regression program.

Data on students' time to degree, demographic and pre-college educational characteristics, enrollment behaviors variables, and academic outcome were assembled into a data file by University Computing Services personnel. A detailed listing of significant and non-significant predictor variables is provided in Table 3.

Results

Tables 4 and 5 show the results for effects upon semesters enrolled-to-degree completions and semesters elapsed-to-degree completions, respectively. Standardized effects are shown and ranked by absolute effect size. All standardized effects highlighted in bold text are significant at the $p \le .05$ level.

The semesters enrolled-to-degree completion model explained 90% of the total variance in time-to-degree outcomes. The strongest predictors are mostly classified among the academic outcome and enrollment behavior variables: average credit hours of enrollment per semester, total credit hours at graduation, number of withdrawn courses, number of failing or non-complete grades, transfer credit hours, number of major changes, number of repeated courses, number of audited courses, dependent financial aid status, and number of semesters living in on-campus housing. Standardized effects on semesters enrolled, ranked by absolute effect size, can be found in Table 4.

The semesters elapsed-to-degree completion model explained 38% of the total variance in timeto-degree outcomes. Similar to the semesters enrolled-to-degree completion model, the strongest predictors are broadly classified among the academic outcome, enrollment behaviors, and major areas: total credit hours at graduation, average credits hours of enrollment per semester, number of failing or non-complete grades, number of major changes, number of withdrawn courses, transfer credit hours, number of semesters living in on-campus housing, dependent financial aid status, and majoring in either the College of Applied Sciences and Technology or Teachers College. Standardized effects on semesters elapsed, ranked by absolute effect size, can be found in Table 5.

Note a number of important differences between these two models. In the semesters elapsed model compared with the semesters enrolled model, the effect sizes of most significant predictors to time to degree (total credit hours at graduation and average credit hours of enrollment per semester) are significantly smaller, while the number of major changes and five major areas' effect sizes increase as their statistical significance becomes more salient.

The non-significant effects, the number of semesters enrolled-to-degree completion, are important to take note of also. These non-significant terms included majors in the College of Architecture and Planning and the Miller College of Business, and the number of degrees earned. In the semesters elapsed-to-degree model, non-significant terms included the number of advanced standing credits; majors in the College of Communication, Information, and Media or the Miller College of Business; total SAT; repeated courses; and number of degrees earned.

Standardized				
Predictor Variables	Effects	P-Value*	Rank	
Average SCH/Semester	-0.754	0.000	1	
Total SCH at Graduation	0.534	0.000	2	
Number of Withdrawn				
Courses	0.088	0.000	3	
Number of Failing or				
Non-Complete Grades	0.051	0.000	4	
Transfer SCH	0.049	0.000	5	
Number of Major Changes	-0.043	0.000	6	
Number of				
Repeated Courses	0.042	0.000	7	
Number of				
Audited Courses	0.04	0.000	8	
Dependent Financial Aid	0.035	0.000	9	
Number of Semesters				
Living in				
On-Campus Housing	-0.03	0.000	10	
Number of Advanced				
Standing Credits	0.029	0.000	11	
High School GPA	0.022	0.000	12	
Major Area:				
Interdepartmental	0.018	0.000	13	
Major Area: TC	-0.009	0.005	14	
Total SAT	-0.009	0.040	14	
Major Area: CAST	-0.008	0.006	16	
Major Area: CCIM	-0.008	0.008	16	
Major Area: CCIM	-0.007	0.009	18	
Major Area: CAP	-0.005	0.071	19	
Gender (Female)	0.004	0.193	20	
Ethnicity (White)	-0.001	0.576	21	
Major Area: MCOB	-0.001	0.676	21	
Number of Degrees				
Earned	0.001	0.659	21	

Table 4: Standardized Effects on Semesters Enrolled-to-Degree Model (Adj.-R²=0.898)

* Standardized effects highlighted in bold are significant at the $p \le .05$ level.

Predictor Variables	Standardized Effects	P.Value*	Rank
Total SCH at Graduation	0.334	0.000	1
Average SCH/Semester	-0.284	0.000	2
Number of Failing or			
Non-Complete Grades	0.208	0.000	3
Number of Major Changes	-0.154	0.000	4
Number of Withdrawn			
Courses	0.108	0.000	5
Transfer SCH	0.098	0.000	6
Number of Semesters			
Living in			
On-Campus Housing	-0.067	0.000	7
Major Area:			
Interdepartmental	0.065	0.000	8
Major Area: CAST	-0.053	0.000	9
Major Area: TC	-0.051	0.000	10
Dependent Financial Aid			
Status	0.043	0.000	11
Gender (Female)	-0.026	0.000	12
Ethnicity (White)	0.020	0.002	13
Major Area: CAP	-0.019	0.005	14
Major Area: CCIM	-0.018	0.009	15
Number of			
Audited Courses	0.016	0.014	16
Number of Advanced			
Standing Credits	-0.011	0.232	17
Major Area: CCIM	0.009	0.195	18
Total SAT	0.009	0.371	18
Number of Repeated			
Courses	0.009	0.395	18
Number of Degrees Earned	0.007	0.369	21
Major Area: MCOB	-0.006	0.395	22
High School Grade Point			
Average	-0.003	0.767	23

Table 5: Standardized Effects on Semesters Elapsed-to-Degree Model $(Adj.-R^2 = 0.378)$

* Standardized effects highlighted in bold are significant at the $p \le .05$ level.

Conclusions and Recommendations

The finding that average credit hours completed per semester and total credit hours at graduation are the strongest predictors of more rapid degree completion is consistent with nearly all previous studies, but it is of particular importance here given the number of covariates included in the study. Since average credit hours completed per semester is far and away the strongest predictor of time to degree, this may suggest the existence of a strong motivational element among students to graduate as quickly as possible.

When the other predictors are examined, there are very few surprises. Across both models, many other predictors (e.g., number of courses students repeated, failed, withdrew from; number of times students changed majors; being dependent in terms of financial aid status) were statistically significant but had very low effect sizes. The increased number of withdrawn courses or failing or non-complete grades, repeated courses, and audited courses increases students' time to degree. One unexpected finding was a negative relationship between the number of major changes and time to degree. While the expected finding might be that the fewer times a student changes his or her major throughout their course of study the more quickly he or she graduates, in this population the reverse was found to be true. It may be that students who change majors more than once might be more motivated to increase their average credit load per semester in order to make up for time lost earning credits not directly applicable to their new major(s).

Before proceeding with a discussion of the implications of these findings, mention of the study limitations are in order. This study used a limited number of variables to explain time-to-degree outcomes. A number of college experience and perceptions of undergraduate experience variables, various types of financial aid variables (e.g., unmet need dollars, campus employment aid dollars, need-based grant aid dollars, etc.), and co-curricular program participation variables were not included in this study due to time and resource constraints but are known to be associated with degree completion based on previous research studies. In order to develop a better understanding that leads to creating a framework that models baccalaureate degree attainment more accurately, future iterations of this analysis should include institutional and survey data covering the variable categories noted above.

The current research offers a number of implications for enrollment management, the first of which concerns the need to get students, in appropriate circumstances, to carry heavier credit hour loads as a mechanism to shorten time to degree. All baccalaureate degree programs require a credit hour load of at least 15 credit hours per semester for students to graduate in 4 years without enrolling in summer sessions. Yet campus policies allow students to be considered as "full-time" for registration, fee payment, financial aid (federal and state policies come into play here as well), and other purposes if they enroll with just 12 credit hours per semester. While a lighter course load may be in the best academic or personal interests of some students, a systemic approach to academic advising that encourages students to take heavier course loads when warranted would significantly decrease time-to-degree attainment for most students. Advising interventions may also help to decrease the number of failed, dropped, or repeated courses.

The Office of Institutional Effectiveness offers the following recommendations based on these results:

- 1. University-wide discussions should be held about undergraduates' course loads and how, when appropriate, students can be encouraged to increase them.
- 2. Academic advisors should encourage students, when appropriate, to take heavier course loads.
- 3. University policies (registration, financial aid, etc.) which define full-time enrollment for undergraduates as 12 credit hours should be discussed in light of these findings.
- 4. Reasons for extended time to degree should be discussed with students by a variety of persons within the University.

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