A Model of First-Year Student Academic Achievement at Four-Year Universities

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 Students entering college for the first time face a world of new social and academic experiences while encountering a variety of feelings. Some view the beginning of college as an exciting time while looking forward to the challenges ahead. For others, the transition to a new social and academic environment can be wrought with stress. No matter which outlook they adopt; all first-year students face changes in their academic and social lives. How they respond to these changes will play a role in their academic achievement and whether they return for a second year (Reynolds & Weigand, 2010).

 Statistics show that the scales are not tipped in favor of student degree completion with first-year students facing the biggest challenges to persistence. 40% of all college students leave before completing their degree (Porter, 1990); only 55% of undergraduates who enrolled in a four year institution in 1995-1996 earned a bachelor’s degree within six years (Lotkowksi, Robbins & Noeth, 2004); the highest percent of students who leave do so in their first year (Tinto, 1993); and more than 30% of first-year students do not return for their second year (Smith, 2002). These statistics bolster the need for continuing research to uncover ways to target students at-risk and to aid in the development of programs to enhance their achievement and persistence.

Many categorical factors can influence students’ choosing to leave an institution or to persist. Levels of social and academic integration (Tinto, 1993), precollege ability, finances, institutional supports, psychological and attitudinal factors, level of parents’ education, socio-economic status and the level of family support are some of the variables whose effects have been studied (Pascarella & Terenzini, 2005). Research demonstrates that the college outcome of academic achievement, as measured by grade point average, is by far the best predictor of first-year students persisting in college to their second year (Nora, Cabrera, Hagedorn & Pascarella, 1996; Pascarella & Terenzini, 2005).

 The sections following will explain academic achievement and its importance as an outcome in higher education. The literature will be reviewed for both academic and non-academic factors that influence academic achievement and also the influence of institutional programs and interventions that attempt to foster this outcome in first-year students. A model depicting first-year student input and the environmental influences related to their experiences with the critical outcome of academic achievement will be proposed and described. The model’s applicability to other student groups will be explored as well as its usefulness for various campus constituents.

**First-Year Students**

 First-year students enter college with a variety of characteristics that will influence how they interpret and respond to situations. One example of this is their perception of the academic environment.

Meyer, Spencer, & French (2009) studied the perception of first-year students in regard to their interpretation of academic rigor prior to and during their first-year of college. They suggest that students often develop their initial perceptions of academic rigor in college through information from interpersonal sources. Students whose close family members have no knowledge of college may access precollege mentors, such as a guidance counselor, teacher, or knowledgeable peer, to guide their thinking. These types of relationships contribute to developing accurate perceptions and future success. Students without access to guidance may formulate inaccurate perceptions from media and the entertainment industry where academic achievement is overshadowed by the social aspects of college. The findings of the qualitative study were mixed with 60% of the first-year students believing that college coursework was less difficult than what their precollege perception implied. One limitation of the study that may have influenced the findings is that the students were interviewed in their first semester of college and had not yet received their final grades. This study supports an important argument by Byrd & Lange (as cited in Meyer, Spencer, & French, 2002) that many first-year students have not yet achieved a level of identity development to process their academic situation with a level of cognitive maturity. Many may express the belief that they are in good academic standing during their first semester, even when they are not. Individual student psychological factors discussed later in the literature review may contribute additional information as to how student characteristics play a role in perception of academic rigor and grades. These results suggest that students need support not only in achieving academically, but some may require guidance in accurately monitoring their own progress.

**Academic Achievement**

Academic achievement is one of many critical variables used in the studies of persistence and retention (Nora, Cabrera, Hagedorn, & Pascarella, 1996; DeBerard, Speilmans, & Julka, 2004). In both large national studies and smaller single institution studies, college grades have been found to be the most statistically significant, consistent predicators of student persistence and degree completion (Pascarella and Terenzini, 2005). Measures of a student’s academic achievement at the end of his or her first year influence the likelihood of whether he or she will return for a second (Nora, Cabrera, Hagedorn, & Pascarella, 1996). Kuh et al. (2007) included academic achievement as an important component when defining student success. Ishitani & DesJardins (2002) found that the higher a student’s first-year grade point average (GPA), the less likely it was he or she would drop out of college.

Lotkowski, Robbins & Noeth (2004) studied the influence of academic and non-academic factors on both retention and performance at four year institutions. They suggest while academic achievement or performance is a critical predictor of college success it is a distinct outcome from retention. Each is affected by distinct variables that combine academic and non-academic factors. A combination of the academic factors of high school GPA and standardized achievement testing combined with institutional commitment, academic goals, social support, academic self-confidence and involvement account for 17% of the variability of college retention across students in the study. High school GPA, and standardized achievement testing combined with academic self-confidence and motivation explained 26% of the variability of students’ GPA. Thus, academic achievement is an important outcome of higher education in and of itself.

Academic achievement is often measured by the GPA of the student. This is obtained by assigning a numerical value to letter grades earned by a student and dividing the total number of points by the number of courses attempted. Pascarella and Terenzini (2005) referred to GPA’s as the “lingua franca of the academic instructional world.” A GPA“buys” the student’s academic standing, entrance to enrollment controlled majors, degree completion, admission to post graduate study, and employment opportunities. Adelman (1999) found that having first year grades in the top two quartiles increases a student’s chance of degree completion two to three times over students with grades in the bottom quartile. Given the predictive power of academic achievement, knowledge of the environmental variables that enhance success toward this outcome should be a critical aspect of higher education research.

**Literature Review**

Academic achievement in college is influenced or affected by both academic and non academic variables (Lotkowski, Robbins & Noeth, 2004). The literature reviews how academic achievement in first-year students can be influenced by a variety of factors (Mansfield, Pinto, Parente, & Wortman, 2009; Kitsantas, Winsler, & Huie, 2008). Categorical variables that affect academic achievement can take the form of precollege abilities, academic skills, personal/psychological characteristics, and institutional efforts to provide support to students (Pascarella and Terenzini, 2005). Mansfield, Pinto, Parente, & Wortman (2009) suggest that “a better understanding of factors that contribute to academic success, the greater the potential for positive and timely intervention to improve the chances of undergraduates earning adequate grades and successfully completing their higher educational experience” (p. 502-503).

This review of the literature will separate variables that influence college academic achievement into two categories. First, the academic and non-academic variables that students bring to campus as input will be considered. All of the studies focus on academic achievement as measured by college GPA as the dependent variable. Some independent variables, such as precollege abilities, are static and operate as predictors of future success while others, such as personal and psychological characteristics and academic skills may be influenced by institutional efforts in the form of programs or supports. These environmental programs and supports will comprise the second group of variables discussed.

**Student Input Variables**

 **Precollege abilities.**

Precollege ability is typically measured by high school GPA and performance on standardized college entrance achievement tests such as the SAT or ACT. Numerous studies have investigated the relationship between these factors and a first-year college student’s GPA. Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) found pre-college academic achievement matters to first-year grades. Lotkowski, Robbins and Noeth (2004) found that the best precollege indicators of first-year college GPA are, in fact, high school GPA and standardized achievement testing. DeBerard, Speilmans, & Julka’s (2004) study of ten academic and non-academic predictors of first-year academic achievement found that high school GPA and SAT scores along with gender, health factors, social support and coping skills accounted for 56% of the variance in academic achievement for their participants. Knowledge of a student’s precollege achievement is important to first-year college students’ academic achievement in that it can be used to identify students at risk and provide early intervention in the form of tutoring or academic skill workshops (Johnson, as cited in Lotkowski, Robbins and Noeth, 2004). It is important to not only identify students who need help, but to also assess the type of help they may need. Referencing individual students’ precollege abilities as well as other identifying characteristics can help to accomplish this goal.

**Personal/Psychological Characteristics.**

 Each student embarks on his or her higher education journey as an individual with specific psychological characteristics. Stupinsky, Renaud, Perry, Ruthig, Haynes & Clifton (2007) found individual difference constructs are major contributors to college students’ achievement. Resilience, motivation, self-efficacy, self-control and self-regulation influence how students respond to academic situations in their new collegiate environment. Understanding how these factors relate to academic achievement can provide information in developing effective supports and selecting the appropriate students for them (Reynolds & Weigand, 2010). Academic motivation and self-efficacy, defined as confidence in one’s ability to achieve, have both been studied as variables that relate to academic achievement with mixed results. Bandura (as cited in Gifford, Briceno-Pirrott & Mianzo, 2006) found self-efficacy to predict academic achievement. Lotkowski, Robbins and Noeth (2004) found academic motivation and self-confidence to be strong predictors of college GPA. They recommend the use of first-year surveys or inventories to identify students lacking these traits and direct them to strategic academic advising and counseling programs. Reynolds & Weigand (2010) studied academic motivation and self-efficacy among other variables and did not find either to be significantly related to academic achievement in first-year students.

 Reynolds and Weigand (2010) define resiliency as “the ability to use personal resources and strengths to cope with adversity.” They found resiliency to be significantly related to first semester GPA. Carlson (as cited in Reynolds and Weigand, 2010) demonstrated similar findings and equated resiliency with the ability to cope and face first-year challenges as a result of successful social and academic integration. DeBerard, Speilmans & Julka (2004) also reported coping as a significant predictor of achievement. These findings support the need for significant attention to first-semester students and their academic progress. Early identification of obstacles and strategies to help students “bounce back” can aid in the development of resilience. Strategies, such as mid-semester grade reports, mandatory mid-semester meetings with advisers or first-year seminar instructors, and programming that addresses common first-year setbacks and how to handle them, are examples of interventions that may bolster resilience in students and improve their academic achievement (Reynolds & Weigand, 2010).

 Closely related to resilience is the psychological characteristic of self-control. This construct has recently emerged as a significant predictor of college GPA (Mansfield, Pinto, Parente, & Wortman, 2009; Gifford, Brieceno-Perriott & Mianzo, 2006; Stupinsky, Renaud, Perry, Ruthig, Haynes, & Clifton, 2007). Stupinsky et al. (2007) suggest that the many transitional challenges first-year students face can lead them to perceive college as a low-control environment. They define perceived control as a student’s belief in their ability to influence aspects of his or her environment. Having the perception of being in control when faced with negative academic situations can affect students’ academic achievement as well as their motivation, effort and self-monitoring strategies. They found perceived self-control to have a significant positive effect on the GPA of first-year students while also finding that self-esteem had no direct influence. They suggest institutions should focus on factors that will increase the predictability of students’ environment. Tutorials of how to select appropriate courses and register, dealing with the procurement of financial aid and scholarships and finding housing can all help students feel more in control. Faculty assistance with course predictability can be achieved through syllabi with clear expectation, rubrics for assignments and open accessibility for help.

 Mansfield, Pinto, Parente, & Wortman, (2009) define self-control as a student’s ability to alter his or her behavior. It emerged in their investigation as a significant influence on academic performance as did several of its sub-constructs such as impulsivity and risk-seeking. Impulsivity relates to a student’s inability to delay gratification while risk-seeking refers to an individual’s desire for risky behaviors. Implications of these results indicate a need for first-year programming to address the importance of self-control, impulsivity and risk-seeking with students.

 Gifford, Briceno-Perriott, & Mianzo (2006) discuss self-control as locus of control, a person’s beliefs about control over his or her life events. Students with an internal locus of control believe their own behaviors influence situations and events and assume responsibility for outcomes. Students with external locus of control typically attribute outcomes to fate or luck and often blame others for their actions (Grimes, as cited in Gifford et al., 2006). Locus of control has been found to be a significant predictor of first-year GPA. First-year students who scored as internals on the measure of locus of control in the study obtained higher GPA’s than those who scored as externals. Implications for institutional programming demonstrate the need to focus on working with students who score as externals. These students may be less likely to seek support services or resources when experiencing academic difficulty due to lack of personal responsibility.

 Kitsantas, Winsler & Huie (2008) focused research on self-regulation which differs from self-control. They define self-regulated students as those “who are independent, self-initiated learners with the ability to use a variety of learning-strategies to accomplish specific learning goals” (p.45). They studied the relationship of self-regulation skills, defined as time management, task value, self-efficacy and test anxiety, along with motivation variables and precollege ability in first-year students. Findings were varied with time management strategies and self-efficacy during the first year contributing to the variance in predicating academic performance over the contributions of pre-college ability. Task value and test anxiety did not contribute to any significant variance. Implications for practice recommended first-year interventions that focus heavily on early intervention and emphasize study skills that teach effective time management. Also recommended is the use of upper-class mentors to help students develop confidence in their ability to navigate introductory courses.

 Both academic and non-academic factors have been shown to play an influential role in first-year students’ academic achievement with varying results. Some limitations such as the use of convenience samples, size of institution, homogeneity of the participants, and timing of the collection of data were cited as factors that influenced the results and lessen the ability to generalize them to other populations. One salient point from the literature reviewed is the suggestion to combine both prior ability predictors with non-cognitive factors to utilize all the significant variables when designing appropriate interventions and recommending them to students (Kinsantas, Winsler, & Huie, 2008).

**Environmental Program Variables**

In acknowledgement of the challenges first-year students face in their transition to college and to improve persistence and retention rates, many institutions of higher education develop programs to help first-year students deal with issues and challenges such as academic achievement and persistence. Many researchers believe that these programs should address issues such as orientation and placement testing, academic skills support, mentoring, supplemental instruction and social support (Tinto, 1993). There is a body of literature that reviews the influence of intervention programs on academic achievement.

**Mentoring.**

Mentoring is a relationship of mutual respect that emphasizes learning (Salinitri, 2005). Salinitri studied the effects of mentoring on first-year students GPA and number of courses failed by first-year students. In her study, mentors taught time management skills, helped mentees to develop study skills and assisted with schedule design. Mentors also directed mentees to resources on campus that could provide additional support. Statistically significant evidence showed that the mentoring program increased students’ overall GPA, and the GPA of their major courses. Mentored students also failed fewer courses and were in better academic standing than students in University 101, a course for first-year students. The mentored students’ achievement levels were higher than those of the University 101 courses students also.

 Flowers (as cited in Lotkowski, Robbins & Noeth, 2004) found that mentoring had positive effects on minority and female students, especially if the mentor was faculty member representative of the same race or ethnicity. Tatum (as cited in Lotkwoski, Robbins & Noeth, 2004) shared that students not in a majority group need to see themselves reflected in the academic environment around them to avoid feelings of marginality that can undermine success.

**Living-Learning Communities.**

Learning communities are based on the premise of Astin’s involvement model (as cited in Pasque and Murphy, 2005). Astin believed that student learning and intellectual development are influenced by factors such as coursework, effort, involvement in out of class activities, and interaction with faculty and peers. Lennings and Ebbers (as cited in Pasque & Murphy, 2005) define learning communities as “consciously and proactively structured student groups organized to promote student learning” (p.431). Studies on how learning communities affected first-year student’s academic achievement, as measured by GPA, had varying results. Pasque and Murphy 2005) found learning communities have a direct relationship to academic achievement for specific students, but the effect was small. Similarly, Purdie and Rosser (2011) found that only one type of living-learning community produced statistically significant higher academic achievement. Students in Freshman Interest Groups (FIG) performed higher academically than those on Academic Theme Floors (ATF). FIG programs in the study sought to create a seamless connection (Kuh, as cited in Purdie & Rosser, 2011) between the out of class residential programming and in-class experiences. The students took four courses together and lived in the same area along with a peer adviser who constructed a small freshman seminar with the students. Students in the ATF program did not have a shared curriculum thus lacked the in-class connection. The authors suggest that the connection to the curriculum and the quantity and quality of peer-to-peer interaction bolster the success of the FIG program. Noble, Flynn, Lee and Hilton (2007-2008) reported similar results for a similar FIG program.

**Engagement.**

 Kuh, Cruce, Shoup, Kinzie and Gonyea (2008) sought to investigate the specific effect engagement has on first-year students grade point average. Engagement was defined and measured by time spent studying, time spent in co-curriculur activity, and engagement in effective educational practices as measured by items on the National Survey of Student Engagement (NSSE). Their study found that student engagement in educationally purposeful activities is positively related to academic outcomes demonstrated by student grades. The positive effects of engagement on achievement cover students from different racial and ethnic backgrounds and can be fostered through program interventions such as first-year seminar courses or learning communities. Kuh et al. found that the benefits of educationally effective activities apply well to students who are underprepared, from low income families, or the first in their family to attend college.

 Keup (2006) found college GPA to be a measure of overall adjustment and achievement during the first-year of college. She noted that there was often a decline between high school GPA and the first year of college. The strongest predictor of the decline is academic disengagement. Her recommendation was for administrators and faculty to work on ways to make sure that first-year students are engaged intellectually. Activities that Keup found to facilitate academic performance were taking an honors course, speaking up in class, and satisfaction with tutoring or other academic assistance.

**Support Services: Academic and Social.**

 Lotkowski, Robbins & Noeth (2004) described an academically focused program entitled Supplemental Instruction (SI). Rather than targeting at risk students, it focuses on courses that are typically troublesome for students. Students who participate in these courses consistently earn better grades than students who attempt the courses on their own (Ramirez, as cited in Lotkowski, Robbins & Noeth, 2004). SI courses emphasize student engagement with the learning and incorporate study strategies such as vocabulary acquisition, note-taking, and test preparation with the course content. Each course has a student SI leader who models how successful students navigate the course.

 Student Support Services (SSS) is a federally funded program, one of the TRIO programs, that offers nine supplemental academic programs to low-income and first generation students. Study skills, tutoring, academic counseling, mentoring, math and writing labs, and workshops provide support to enhance academic achievement (Pascarella & Terenzini, 2005).

 Multicultural centers provide both academic and social supports by giving students of color and ethnicity a place to gather. Peers provide a shared cultural identity and staff can fulfill a mentoring role, if needed (Landry, as cited in Lotkowski, Robbins & Noeth).

**First-Year Seminars.**

First-year seminars (FYS) all vary in their content and structure, but all have the goal of improving academic performance and persistence in first-year students. They appear to benefit all types of students. Studies relating participation in a FYS and academic achievement will usually find a statistically significant relation between the two (Pascarella & Terenzini, 2005).

Jamelske (2007) studied the influence of a first-year experience (FYE) class on the GPA of a class of first-year students. The stated goal of the FYE program was “to enhance the quality of the first year experience and student success across the domains of learning, satisfaction and retention” (p. 377). Students connected with peers and also worked closely with a faculty member on both in-class and out-of- class activities to strengthen their connection to the university community. The results showed no significant effect of the FYE experience on retention, but students in the FYE had higher GPA’s than non-participating students.

**A Model or Framework for First-Year Student Academic Achievement**

 The model is based on Lotkowski, Robbins and Noeth’s (2004) suggestion that institutions of higher learning find methods of identifying students who need help and the types of help they need while keeping in mind that both academic and non-academic variables affect student achievement. Kuh et al. (2008) also suggest “that to effectively provide early interventions and attention to transitioning first-year students, institutions must understand who its students are, what they are prepared to do academically and what they expect of the institution and themselves” (p. 555). He went on to suggest that interventions should be of high quality and customized to meet the needs of the students for which they are intended. Kuh’s sound intervention system requires early warning systems (inputs) and interconnected learning support safety networks (environment).

 The academic variables of high school GPA and achievement test scores are readily available and can be used to find students who may benefit from academic support such as skill workshops or tutoring. It has been shown, however, that non-academic variables also influence college achievement in many different ways. Stupinsky et al. (2007) believe individual difference constructs are major contributors to college student achievement. Formal college surveys such as Your First Year College Survey questionnaire or student profiles or inventories can be distributed along with college placement tests to gather a more complete data package that will help to identify the non-academic constructs of first-year students who would benefit from various programmatic interventions. Advisers and faculty members are also in positions to identify students who may exhibit behaviors that indicate a need for specific interventions. Thus, the input section of the framework demonstrates a combined approach that yields results to better match a student with appropriate environmental interventions to enhance conditions for academic achievement (See Figure 1).

**Figure 1 A Model of Academic Achievement for First-Year Students**

**Academic Variables**

**High School GPA**

**Standardized Achievement Scores**

* **SAT**
* **ACT**

**Socioeconomic Status**

 I E O

**First -Year Seminars**

**Living –**

**Learning Communities**

**Support Services Social/Academic**

 **Mentoring**

**Engagement**

Academic

Achievement

 **+**

**Non-Academic Variables**

**Age, Race, Gender**

**Psychological Characteristics/Attitudes**

* **Resiliency**
* **Self-regulation**
* **Motivation**
* **Self-confidence**
* **Self-efficacy**
* **Self-control**

**Academic Habits**

 Persistence

 Retention

 Specific environmental interventions will be better suited to strengthen various academic and non-academic variables. The overlapping arrows show the many different combinations that need to be considered when choosing an intervention. The arrows look somewhat tangled and chaotic. This represents the complicated task of unmasking the specific academic and non-academic variables that put a student at risk and subsequently matching the student with the most appropriate intervention. Students who are identified as lacking resilience with a damaged self-confidence may profit from the guidance of a mutual mentoring relationship where the mutual respect and care from the mentor helps to build the weakened constructs. Students identified as lacking self-control or having an external locus of control may garner better benefits from workshops facilitated by the counseling center. Students with low high-school GPA’s and achievement scores and a weakened sense of self-efficacy and motivation may benefit best from academic workshops that focus on time management and study skills. Many students would thrive from the opportunity of participating in a learning community such as a freshman interest group that links both in-class and out-of -class experiences while fostering peer engagement. Social and academic integration are important elements of college achievement and persistence (Tinto, 1993), but not all students require environmental interventions to integrate.

 Some students arrive at college with strong precollege ability and healthy doses of motivation, self-efficacy, self-regulation and resiliency. These students will mostly likely navigate the campus environment autonomously and experience successful academic achievement while bypassing the need for intervention. In the model they are represented by the dotted lines. Yet Kuh et al. (2008) suggested that these students may need to be challenged to be engaged and feel satisfaction with the institution. Again, faculty members and advisers have a key role in assessing the needs of these students and providing them with research opportunities or similar challenges.

**Applicability of the Model to Other Communities**

This model was developed from a review of literature that researched academic achievement specifically in first-year students. The findings were tailored to this population and thus, would not pertain to upperclassmen. The model was based on research with first-year students from four- year universities. It would not apply to students in two-year universities such as community colleges.

The variables in the model were adopted from studies in the review of literature. Many contained a variety of limitations. Some were conducted using only convenience samples that were drawn from their own college campuses. Thus, caution must be taken when applying the results to institutions of different sizes and types. Some of the studies in the literature concerning psychological constructs had varying results for students of color, while others found similar results across sub-populations. Reynolds & Weigand (2010) noted that the potential effects of academic motivation, self-efficacy and resilience for the differential impact of interventions on various groups of students deserves further explanation.

Since each student’s input is considered individually when determining the need for or type of environmental intervention, the model should apply evenly to most first-year students. All students will bring with them individual academic and non-academic variables regardless of gender, race or age.

**Recommendations for Use of the Model**

The model demonstrates a plan for helping all first-year students to attain academic success. It would be prudent for administrators to consider the implication of how use of the model could guide the improvement of first-years student academic to influence persistence and retention figures. By studying the model, administrators could begin to plan strategically for changes in the way precollege data is collected from students. Administrators could outline a path toward the academic achievement of all students in the strategic plan and budget money for a variety of programs aimed at addressing both the academic and non-academic variables, as well as combinations of both.

 Admissions and orientation offices typically are interested in and influenced by the variables students bring with them to college. Planning for extended collection and analysis of non-academic data via surveys or inventories would fall under their purview. Collaboration and sharing of this data with advisers would allow for early intervention of at risk students and the opportunity to plan for immediate interventions at the beginning of the fall semester.

 The model should provide faculty with food for thought on how they can play a decisive role in increasing the academic achievement of first-year students. Through engaging lessons both academic and social integration can occur in the classroom (Kuh et al., 2007).

**Summary**

College academic achievement which has been shown to be highly correlated with first-year student persistence and retention is predicted by a student’s high school GPA, but is influenced by much more. Students can change their expectations when they come to college depending on how they perceive the academic environment. How a student views their coursework and learning can be very different from when they studied in high school. The most thorough way to assess and maintain academic achievement is through a careful examination of both academic and non-academic variables for individual students. The results can be used to determine which, if any, environmental programs or interventions would be beneficial tools to support students with their attainment of the critical outcome of academic achievement.

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