Critical Building Blocks: Mandatory Prerequisite Registration Systems and Student Success

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Many colleges and universities require prerequisites prior to enrollment in introductory composition courses; however, enforcement of prerequisites is not consistent across institutions. In this study, we examine the impact of an automated, mandatory prerequisite enforcement system on students and advisors at a public comprehensive university. Results indicate that prerequisite systems are positively associated with student outcomes including improved GPAs and retention rates; furthermore, while functioning similarly to prescriptive advising, prerequisite systems can also facilitate developmental advising relationships between students and academic advisors.

KEYWORDS: departmental/course advising, developmental advising, prescriptive advising, self-advising

Many colleges and universities require prerequisites prior to enrollment in introductory composition courses, including ACT, SAT, Accuplacer, Compass, or other placement test scores; developmental course work; transfer credit; or other measures of proficiency that prove students possess the skills to facilitate success in the composition classroom. Yet, the means by which colleges and universities choose to enforce prerequisites may vary across campuses. Some registrars place holds on student registration within a computerized registration system, while others require the faculty to enforce prerequisites as courses commence. Still others rely upon academic advisors to register students into correct composition courses, while those without mandatory advising entrust students either to seek out advising opportunities or to self-advise and enroll in the appropriate sequence of composition courses. These registration choices can reveal a range of theoretical approaches toward academic advising, from a prescriptive practice in which students have little agency to make their own choices (Bland, 2004) to a developmental style that more equitably includes students in decision-making processes (Walsh, 1979).

In this study, we examine the impact of changing the prerequisite management system for an introductory composition course at a large public university. Outcomes explored include effects on students' grades and retention in addition to the overall impact on advisors, students, and the institution.

Advising and Placement in Composition Courses

We define *prerequisites* as the means by which a student can satisfy the institution's requirement to enroll in a course. Prerequisites could include developmental course work, transfer credit from another institution, or a minimum score on a placement test. The majority of colleges and universities rely upon placement tests as prerequisites for composition courses, including a range of standardized tests or writing assessments that are personally evaluated by advisors or composition faculty (Huot, 1994); however, the particular advantages of standardized placement tests over writing assessments include measures of reliability and validity that can be difficult to guarantee when evaluating individualized writing assignments or portfolios (Harrington, 2005). Raising concerns, Neal and Huot (2003) observed that "the most important questions we or anyone else can raise about the use of a specific measurement is to look at the validity of the decisions made on its behalf" (p. 248).

Instead of relying upon traditional measures of meeting prerequisites, some academic advisors and writing program experts advocate for directed self-placement (DSP), a developmental advising approach in which students' and writing administrators' input contribute to the determination of the courses in which students should enroll (Royer & Gilles, 1998). In the DSP method, students reflect upon writing course descriptions and perhaps their own performance on a diagnostic essay as well as recommendations from writing experts before making a placement decision. DSP differs from traditional objective placement measures because it relies on joint decision making from stakeholders in determining the best path for individuals. Some have identified potential problems with DSP (Bedore & Rossen-Knill, 2004), including challenging the notion that students can make informed decisions about their own writing abilities or that they essentially have been given a forced choice. In

addition, others articulated problems with validity when analyzing their university's DSP data (Gere, Aull, Green, & Porter, 2010). At the very least, DSP measures are attempts to mediate tensions between "advising/guiding students and fostering individual agency" (Gere et al., 2010, p. 170).

While DSP provides some opportunities for students, many universities do not have sufficient resources to offer this type of mandatory advising. As a result, some students must self-advise their way into composition courses without seeking guidance from university staff and making uninformed decisions when enrolling. By contrast, the strategy of enforcing mandatory prerequisites ensures that all students registering for a composition course meet specific conditions prior to enrollment, regardless of whether they self-advise or seek assistance from an advisor. Establishing prerequisites through standardized testing or transfer credit—objective measures—are also preferred by institutional leadership who are concerned about subjectivity and potential for human error by faculty members or academic advisors, who may incorrectly place a student into a course above or below his or her skill level. Although some argue that they are not holistic measures of students' writing abilities, standardized testing and credit systems are far less time-consuming than individual assessments of student writing skills (Harrington, 2005).

Relationship between Prerequisites and Outcomes

According to Abou-Sayf, the most "common types of prerequisites are those in English and mathematics" (2008, p. 47); however, most research studies focus on the impact of prerequisites in science or mathematics courses rather than composition courses (Arismendi-Pardi, 1997; Simpson & Eddy, 1991; Wilson, 1994). Students who do not meet prerequisites for courses may be underprepared for the demands of college-level course work, thus potentially compromising their success in the course and overall persistence in college. Many researchers have documented the importance of prerequisites on students' grades; for example, Buschens and Watts (2001) found that students who do not meet prerequisites for economics courses received lower final grades than those who had taken the precursor courses. Others have found that students who met prerequisites in math courses had greater rates of success and retention than those who did not (Jacobson, 2006). Prerequisites appear to matter not only to individual students but also to their peers: Students are likely to receive lower final grades in courses where a high proportion of their classmates lack prerequisites (Buschens & Watts, 2001).

While success has been demonstrated in some research studies (Abou-Sayf, 2008), opponents of mandatory prerequisite enforcement at open-access institutions have often cited concerns that mandatory prerequisites threaten the egalitarian position behind open access to higher education (Hadden, 2000). For example, Willett (2000) reported that implementing prerequisites led to a modest increase in student performance yet also resulted in a significant decrease in enrollment numbers. Some cited that mandatory prerequisites may unnecessarily prolong the time it takes a student to graduate (Abou-Sayf, 2008) while others noted the administrative hurdles of implementing mandatory prerequisites (Berger, 1997).

Because of the multiple concerns and disciplinary assessment methods noted, research into the effectiveness of implementing mandatory prerequisites into computerized registration systems (hereafter, "prerequisite systems") is warranted. Academic advisors, who may be entrusted with informing students about entry-level courses, are particularly invested in these issues as they often guide students into course choice or enforce mandatory prerequisites at their institutions. The results may be especially relevant to institutions that do not yet have prerequisite enforcement in place within their registration systems.

Prescriptive and Developmental Models of Advising

To better understand the function and effects of a mandatory prerequisite registration system, we frame our paper within theories of prescriptive and developmental advising. We compare automated prerequisite systems to prescriptive modes of advising. Under a prescriptive model of advising, academic advisors address course selection and academic regulations and hold much control and power over the advising session while students have little agency to make their own choices (Bland, 2004). In a similar manner, prerequisite systems control students' registration behaviors and prohibit them from making their own choices. The prescriptive advisor may view the student as "immature, irresponsible, needing close supervision, and often incapable of making sound decisions" (Crookston, 2009, p. 80); similarly, prerequisite systems are based on the assumption that students are incapable of registering for the

appropriate courses and so are denied choices that might lead them to incorrect courses.

Prescriptive advisors tend to make judgments on past records and test scores (much like those who use mandatory, automated prerequisite systems to determine the proper course placement for students), whereas those adhering to a developmental advising philosophy may look to student potential in a wide spectrum of performance possibilities and see the student as "growing, maturing, responsible, and capable of self-direction" (Crookston, 2009, p. 80) (which is consistent with the DSP approach for determining appropriate courses). Scholars have long recognized that an integrated developmental advising approach assists students in achieving "growth in self-awareness of the relationship of education and life … and growth in the awareness of life extending beyond just the four years of college" (Walsh, 1979, p. 447). Effective developmental academic advising is holistic and dynamic; Lowenstein's key insight into the developmental advising model is that "in any particular advising encounter, the goal should extend beyond the specific substantive question at hand; it should be broader, more lasting, and more profound than the prescription of advice" (2005, p. 67). We believe that mandatory prerequisite registration systems in-and-of-themselves function similarly to prescriptive advising: Seen in isolation, these prerequisite systems seem authoritative and controlling, often prohibiting students (especially those who self-advise) from making their own choices with regard to placement in courses. However, we hypothesize that mandatory prerequisites systems comprise critical building blocks that foster opportunities for developmental advising on campuses by facilitating students' efforts to seek advisors to discuss registration.

To be an educative process, advising should expose the student to intentional learning experiences that lead to the achievement of educational objectives. Prerequisite systems can provide such learning experiences because students who do not meet prerequisites cannot register and subsequently seek advisor assistance to learn the reasons for registration denial. In a meeting with an advisor, the student learns more about the importance of meeting the required prerequisites for courses. The earlier students learn that they do not meet prerequisites (i.e., upon registration in April or May as opposed to the first week of class in August or September), the more time they have to meet with an advisor who can clearly explain the prerequisites, help students plan to meet prerequisites, and explain the benefits of meeting prerequisites before taking the course.

Prerequisite systems (as automated prescriptive advising) can invite developmental advising opportunities between advisors and students—especially among students who self-advise. Seen in this way, this prescriptive mode of advising can be advantageous; as Fielstein (1994) argued,

> Perhaps in our enthusiasm for developmental advising, we overlooked the obvious, the value of certain traditional, prescriptive activities as prerequisites to developmental advising. It could be that some of the so-called prescriptive activities have been given a bum rap and are actually critical building blocks that enable developmental advising to evolve. (p. 77)

As critical building blocks, prerequisite registration systems can lay a foundation for developmental advising opportunities between advisors and students. While mandatory prerequisite systems do not necessarily guarantee the development of collaborative advising relationships, an institutional advising organization that integrates a prerequisite system can facilitate developmental advising opportunities that may otherwise be lost to students choosing to self-advise.

Research Questions

We developed this research project into two phases. First, we sought to determine the impact of a mandatory prerequisite system on students' introductory composition grades and university retention from the current year of enrollment to the following year. In phase two, we developed a nuanced understanding of the effects of a prerequisite system on student success. For this latter phase, we looked at the prerequisite system effect on student registration experiences, advisor processes and workload, and other university functions by conducting a survey with staff and faculty academic advisors. Taken together, these questions build toward a theory of prerequisite system impacts and enable advisors and advising administrators to weigh the potential pros and cons of implementing mandatory prerequisites into their computerized registration systems.

Methods

Setting

We conducted the study at a public university described by the Carnegie Foundation for the Advancement of Teaching (2011) as a medium, 4-year, primarily nonresidential campus. In Fall

2009, enrollment was between 15,000 and 16,000 undergraduates of whom approximately 6,500 attended full-time and 9,000 were part-time students. This land-grant, primarily open-access, undergraduate university admits most students into noncompetitive academic majors without minimum placement test scores and a nominal high-school GPA requirement. Enrollment in the introductory writing course for fall semesters typically averages between 1,000 and 1,100 students with another 800 to 1,000 registering in the spring semester.

Advising at this university is not mandatory for the majority of undergraduates and is based on a shared model (Pardee, 2004), with first-year, undeclared, and associate of arts students advised at a central office, some students advised by staff housed in one of seven colleges, and others receiving faculty advising based on academic major. Prerequisites for enrollment in introductory composition include placement test scores, passing grades in a developmental preparatory course (an alternative for those students not meeting placement test scores), or transfer credit.

Prior to Summer 2008, English department faculty were responsible for enforcing prerequisites for introductory composition. Any student could register for introductory composition, whether or not she or he met the prerequisite placement exam scores or had completed adequate developmental course work. With little direct guidance from university personnel when registering for courses, many students relied upon their own understanding of the role and importance of the placement tests and their scores. As a result, many matriculating students, often unaware of prerequisites, self-selected into the composition course they felt most appropriate for them.

During the first 2 weeks of the semester, individual faculty members were charged with asking students to provide proof of placement exam scores, transfer credit, or completion of developmental course work. Students without proof of prerequisites took a placement exam on campus (the Accuplacer) or withdrew from the course. During Summer 2008, we counted the number of students who had registered for a fall introductory composition class without proof of prerequisites in the student records database. We found that nearly one half of registered students had no proof of meeting the prerequisites in their student records (431 of 990). Further complicating student registration during the first 2 weeks of classes, more than 700 students who met prerequisites for introductory composition were unable to register due to a lack of open seats. Therefore, approximately 1,100 students were enrolled in the wrong introductory composition class or were qualified to attend the class but were denied access. As a result, the campus instituted a prerequisite system that prohibited students who did not meet prerequisites from registering for compostition courses. As with other institutions, the goal of the new policy was "increased rates of student success without reduced access" (Berger, 1997, p. 40).

Procedure

The placement of a barrier in the computerized registration system so that students without prerequisites could not register for certain courses created a quasi-experimental design in which we could test the effect of the prerequisite system on control (pre-2008) and treatment (post-2008) groups. We conducted a mixed methods study including a quantitative analysis to determine the prerequisite system's impact on student outcomes and a quantitative/qualitative survey of university academic advisors' opinions about the impact of the new prerequisite system on students, advisors, and the university.

Sample

To capture data related to student outcomes before and after the mandatory prerequisite system, implemented in Fall 2008, we examined all students who enrolled in introductory composition for Fall 2007 (1,106 students) and Fall 2009 (1,044 students). The demographics for each group are represented in Table 1.

Additionally, we distributed an online survey to faculty and staff advisors to obtain their opinions about the ways the prerequisite system impacted students, advisors, and the university (see Appendix). Such a measure, in combination with knowledge about how the prerequisite system benefits student outcomes, enabled us to build toward a theory of prerequisite system impact in the domain of academic advising. A variety of advisors completed the survey, with varying response rates. Seventeen staff advisors received the survey, with a response rate of 65% (5 college-level advisors and 6 department-level advisors). Additionally, nearly all of the university faculty received the survey, with 16 faculty advisors responding (3%). Twelve enrollment and financial aid advisors received the survey, with 3 responding (25%). Finally, 1 administrator and 1 who identified with an advising role as "other" also responded but could not be identified

Table 1. Demographics of introductory composition students

Characteristic	Fall 2007	Spring 2009
Age (mean and range), years	22 (15-59)	22 (16-61)
Gender (female)	57.1%	51.8%
Alaskan Native or American Indian	10.9%	8.5%
African American	4.7%	3.5%
Asian, Native Hawaiian, or Pacific Islander	10.8%	7.4%
Hispanic	5.8%	4.3%
White	62.9%	59.3%
Other/unknown	4.8%	17.0%

within groups due to the anonymity of the survey. Most advising of first-year students is conducted by department and college advisors and facilitated by enrollment and financial aid advisors; as a result, we expected the low response rate among faculty advisors because the survey concerned a freshman-level introductory composition course.

Analysis

In this mixed methods study we incorporated several analytical methods, including linear regression to determine the effect of the prerequisite system on students' grades in the introductory composition course and logistic regression to determine the effect of the prerequisite system (0 = control, 1 = implementation of prerequisite system) on a dichotomous outcome (retention from current year to the following year) (0 = did not return, 1 = returned). In our models we also controlled for dichotomous covariates related to student precollege characteristics, including gender (female = 1, male = 0), race (students of color = 1, White = 0, with "unknown" race removed), and age. For the linear regression related to grades in introductory composition, we controlled for the effects of precollege composition abilities, as determined by ACT Reading and SAT Verbal scores (two standardized instruments used to place students into introductory composition at this university). Finally, for the logistic regression related to students' retention, we also controlled for effects of students' introductory composition grades.

Additionally, for the second phase of our research, we employed descriptive and qualitative analysis on the academic advisor surveys. The use of qualitative data provided rich insights into the descriptive quantitative results; to analyze the qualitative data, we developed a set of questions and constructs around which to analyze advisor responses. These a priori constructs helped us focus the conversation, constrain irrelevant or tangential information, and sharpen external validity (as per Pandit, 1996). We started the analysis by using open coding—"tagging any unit of data that might be relevant to the study" (Merriam, 2009, p. 200). Strauss and Corbin (1990) explained that open coding "fractures the data and allows one to identify some categories, their properties and dimensional locations" (p. 97).

We next conducted selective coding, which reflects the development of "a core category, propositions, or hypotheses" (Merriam, 2009, p. 200). According to Merriam (2009), qualitative researchers build toward theory by gleaning "bits and pieces of information from interviews, observations, or documents" that are "combined and ordered into larger themes as the researcher works from the particular to the general" (p. 15). Our coding strategy allowed for themes to emerge from the data that we subsequently used to build a theory upon which to understand the effects of prerequisite systems on students, advisors, and the university.

Results

We examined the effects of prerequisite systems on student outcomes, including students' introductory composition grades and their retention status the year after taking the class. As a precursor to determining the effect of the prerequisite system on introductory composition grades, we first recoded students' grades so that they reflected a numerical point system (A = 4, B = 3, C = 2, D = 1, F = 0) and we recoded other grades (W = withdraw, AU = audit, etc.) as missing data because they have no numerical grade-point values. When we investigated the effects of the prerequisite system, the overall linear regression was statistically significant ($p < .05$) and we found that the model accounted for 12.6% of the variance in students' introductory composition grades (Table 2). Of particular interest, when the effects of precollege characteristics and composition-related abilities were controlled and all factors held constant, students' GPA for the semester

in which the prerequisite system was implemented (Fall 2009) was .74 higher than it was the prior year to prerequisite system implementation (Fall 2007). Our model predicts that, among other expectations, when the continuous variables are held at constant means, the average introductory composition GPA for female students of color in Fall 2007 is predicted to be 2.28 and the average GPA for female students of color in Fall 2009 is predicted to be 3.02.

We conducted a logistic regression analysis to predict students' retention using the prerequisite system, gender, race, age, and introductory composition grade as predictors. A test of the full model against a constant-only model was statistically significant, indicating that the predictors are reliably distinguished between returners and nonreturners (χ^2 =185.11, $p < .001$, $df = 5$). Controlling for all other variables in the model, students taking introductory composition in Fall 2009 (when the prerequisite system was initiated) were 1.38 times more likely to reenroll the following year (Table 3).

Building a Theory toward Understanding the Effects of the Prerequisite System

Via a combination of qualitative and quantitative analyses, we identified several themes related to the effect of prerequisite systems on students, advisors, and the university. These themes suggest that the prerequisite system enhances students' decision-making capacity, reduces registration and advising errors, promotes equality in registration for introductory composition, and facilitates developmental advising opportunities for students. These themes further reinforce the notion that the prerequisite system technically and administratively functions similar to prescriptive advising, but also that it facilitates opportunities for developmental advising, especially among self-advised students.

Table 2. Regression results on the effects of the prerequisite system on introductory composition grades

Predictor	*B*	*SE*
Constant	3.33*	1.58
Prerequisite system	0.74*	0.32
Female	0.53	0.30
Students of color	-0.34	0.32
Age	-0.05	0.05
ACT reading score	-0.07	0.04
SAT verbal score	0.003	0.01
R^2	.126	

Note. * $p < .05$

Enhances Student Decision-Making Capacity

One of the primary findings suggests that prerequisite systems can positively enhance students' capacity to make better decisions when self-advising and registering for courses. Advisors were more likely to indicate that the system allowed "students to make better decisions when registering for courses" and that "prerequisite enforcement prevents students from making inappropriate decisions" more than other options (Table 4). The qualitative responses reinforce this finding; for example, one advisor wrote that "students are more empowered to better direct their academic progress." Another noted that "it makes them pay more attention to their class schedule and plan ahead." Such results are akin to many of the goals found in a developmental advising philosophy, which empowers students to take responsibility for their education and become an active participant in their decisions.

In general, the prerequisite system appears to enhance students' decision making by serving as a source of information; prohibited registration proves an informative experience for students. As a result, according to one survey respondent, "Students are more aware of prerequisite and testing requirements for the course and are more likely to follow the appropriate steps to be eligible to take the class." Another advisor noted that "students are

Table 3. Logistic regression analysis of the effects of the prerequisite system on students' retention

Predictor	*B*	*SE*	Wald's χ^2	*df*	e^{β} (odds ratio)
Constant	0.06	0.23	0.07	1	1.06
Prerequisite system	0.33**	0.11	8.40	1	1.38
Female	0.33**	0.11	9.01	1	1.39
Students of color	-0.09	0.12	0.53	1	0.92
Age	-0.04***	0.04	15.87	1	0.97
Composition grade	0.45***	0.04	138.64	1	1.57

Note. R^2 = .10 (Cox & Snell, 1989) and .15 (Nagelkerke, 1991). ** $p < .01$; *** $p < .001$

informed of what they need to do and have enough time to do it." One advisor wrote that the prerequisite system had "simplified and clarified [the] process" and another noted that "it gave an easier to understand process for [introductory composition] registration eligibility." In general, advisors believe that the prerequisite system increased students' awareness of the prerequisite for the course thereby enhancing their ability to make decisions regarding enrollment; that is, the prerequisite system enhanced students' abilities to make the most appropriate decisions regarding course enrollment. The prerequisite system therefore serves as a supplemental tool to the course schedule or university catalog in providing information to students and enabling them to make better decisions when enrolling in composition courses.

Reduces Registration and Advising Errors

In another primary theme, the prerequisite system reduced the potential for advising or registration errors. Advisors indicated that with the prerequisite system "students are prohibited from selecting incorrect courses" (Table 4). One staff advisor noted that the system resulted in "fewer registration errors. Those errors cost students in terms of GPA, tuition dollars, and academic standing." The cut-and-dry, prescriptive prerequisite enforcement appears to also make advising easier; one faculty advisor noted that it "simplified my work in advising for [introductory composition]" while another noted that "boundaries are much more clear, so advising is easier and clearer." We surmise that clarity in advising likely contributes to the reduction in registration and advising errors as well.

Prior to the prerequisite system, the first weeks of class were often turbulent for composition faculty members, who were tasked with checking students' prerequisites. This process may have introduced error into the process as faculty members undoubtedly faced challenges in verifying the accuracy of placement exam scores on transcripts, interpreting scores, evaluating transfer courses, and keeping track of student paperwork. Acknowledging this potential for error, one advisor mentioned that the new prerequisite system prevented "instructor-shopping for someone who would let a student into a course they haven't qualified for." Another faculty advisor noted the "nightmare" of the "chaos in the first two weeks in class for the instructors of [introductory composition]" and further acknowledged that "asking faculty to be the judge of the appropriateness of the prerequisites is a lot to handle."

Promotes Registration Equality

Several advisors noted that the prerequisite system enhanced registration equality among students by eliminating competition between qualified and

Table 4. Top 15 responses to survey items regarding prerequisite system impact on students, advisors, and the university

Survey Items about the Prerequisite System	*M*	*SD*
Prerequisite enforcement prevents students from making inappropriate decisions related to registration	2.89	0.99
Students make better decisions when registering for courses	2.86	0.85
Students are placed into the right courses for their writing and reading abilities	2.86	0.93
Students are more prepared to be successful in their composition courses	2.86	0.80
Reduces registration errors	2.84	0.90
The new system reduces staff and advisor advising errors	2.84	1.03
Students are prohibited from selecting incorrect courses	2.79	0.92
Students who do not meet prerequisites are prompted to contact an advisor to learn why they cannot register for a blocked course	2.79	0.88
Students are more successful in their composition courses	2.75	0.93
Staff and advisors are burdened with providing more prerequisite information	2.72	0.79
Staff and advisor workload is increased in this area	2.72	0.74
Students are better prepared to learn how to meet prerequisites	2.68	0.82
Students who do not meet prerequisites are prompted to contact an advisor to learn why they cannot register for a blocked course earlier in the registration process	2.61	0.88
Staff and advisors are able to assist more students with composition course registration	2.52	0.82
Offices are run more smoothly at the beginning of each semester	2.52	0.92

Note. 1 = *strongly disagree* and 5 = *strongly agree*

unqualified students for a limited number of seats in class. Pointing out that prepared students have "fair access to appropriate courses," one faculty advisor also noted that students who meet prerequisites benefit most because of "more class slots for qualified" students. Another pointed to the fairness of a standardized system by stating, "The process has enabled equality in the enforcement of policy" and "it is now easier for students to register for English because fewer seats are taken by those not eligible." However, others expressed concerns such as the following:

> This has only increased the marginalization of certain students. We are a huge, confusing institution, and this does not seem to help incoming first year students understand the university nor feel welcome here. Students feel discounted as individuals and rejected by [introductory composition].

While most generally acknowledged potential barriers for students unqualified to take the course, most advisors discussed the benefit of enrolling prepared students: "It probably created barriers for some, but without those barriers, a poorly-prepared student would have been able to take the class and do less well than if he or she was ready for it."

Many advisors also saw the benefits of equality in regard to the "consistent enforcement of prerequisites" because the rules apply the same to all students. In addition, everyone is

> given clear standards and requirements, given time to take placement exams, and start at an appropriate course level. They have fewer disruptions to their schedules (less hassle with class changes at the last minute, don't have to exchange books, etc.) and can start with some sense of stability and readiness.

The sense of fairness and equality extends to composition instructors, who have "semesters [that] run more smoothly. They can get to the business of teaching and learning instead of pushing paper and switching sections." Finally, all introductory composition students benefit because "prior prereq checking allows for faculty and students to start learning on day 1 instead of taking care of 'business.'"

Promotes Developmental Advising

Many advisors found that the prerequisite system promoted opportunities for students to engage in developmental advising by encouraging those who self-advised into the incorrect level of introductory composition to contact an academic advisor for assistance. While the extent of these developmental moments were not clear from advisors' responses, clearly many respondents believe the prerequisite systems led to opportunities to reach students in substantive ways. Advisors made statements indicating that "students who do not meet prerequisites are prompted to contact an advisor to learn why they cannot register for a blocked course," "students are better prepared to learn how to meet prerequisites," and "staff and advisors are able to assist more students with composition course registration" (see also Table 4). As a result of the prerequisite system, advisors said they could spend more time in a developmental advising capacity; one advisor wrote: "My work has increased in terms of answering student questions on how to get into [introductory composition]. I spend more time explaining why the university would have such a policy in the first place." In another example, one respondent stated that the prerequisite system "frequently requires students to contact faculty or student services." While the function of the prerequisite system closely mirrors prescriptive advising, because it "directs and dictates" student registration, for self-advising students who might incorrectly place themselves into an inappropriate composition course, it promotes opportunities to engage in developmental advising where they learn about the reason for and importance of prerequisites (Bland, 2004).

Advisors indicated that the prerequisite system benefits students, advisors, and composition faculty members alike. They indicated that "prepared students are better students" and that "proper placement saves students time, money, and energy." Overall, advisors found value in having prerequisites for courses: "Prereqs are there for a reason. Having background and foundational information makes a big difference in the level of understanding and of ability." The prerequisite system, in summary, promotes opportunities to help students learn about the "foundational knowledge and skills necessary to succeed" in their introductory composition courses. While we acknowledge the prerequisite system does not guarantee developmental advising opportunities, we believe it serves as an important gateway for many students to benefit from developmental advising.

Discussion and Implications

In this study, we demonstrate the benefits of a mandatory prerequisite system and the means by which it is a prescriptive tool with the potential

to facilitate developmental advising opportunities. Implementation of a mandatory prerequisite system positively affected students' introductory composition grades and their retention. Through the enforcement of mandatory prerequisites, many students enrolled in developmental composition courses, a measure that could have contributed to the subsequent increases in students' grades. Ensuring that students meet prerequisites—including through the completion of developmental course work—is an important step that advisors can take toward increasing students' academic success.

Due to the association between automated prerequisite enforcement and students' introductory composition grades and retention, institutional administrators may wish to reconsider policies that allow for student self-placement into composition courses or that may allow students who met prerequisites to register for composition courses. Students who self-advise into courses may not have the institutional knowledge to choose the right level of courses; indeed, we found that over one half of students who registered for introductory composition had not met the prerequisite for the course. Such findings demonstrate the importance of automated prerequisites systems, especially at institutions without mandatory academic advising.

Prerequisite systems can serve as fundamental building blocks to foster a developmental, advising-as-teaching relationship between students and advisors. Ryan (1992) wrote that advisors should assist students in developing self-understanding and self-acceptance, creating an educational plan consistent with life goals and objectives, and evaluating their progress toward established goals and educational plans. In meeting with students to discuss prerequisites, advisors can discuss students' current skills and abilities, help them to develop an appropriate educational plan around their abilities, and assist in charting a successful path toward graduation. Through a developmental advising approach, advisors can empower students to make decisions based on their unique abilities, goals, and attributes.

Placing teaching and learning at the center of academic advising also means that academic advisors must create and organize situations that assist students in meeting learning goals (Hemwall & Trachte, 2005). Prerequisite systems can help students to learn about the importance of developmental progression toward learning goals. Students arrive at the advising session with various skills, learning styles, and experiences. Advisors must acknowledge that students attend college for various reasons; aim to engage students in a dialogue where they have the opportunity to express, justify, and discuss their reasons for attending college; and assist them with setting their learning objectives.

The findings reveal that adopting a prescriptive approach toward advising students for introductory composition offers several benefits. We found added benefit to establishing a mandatory prerequisite system in eliminating the potential for student, faculty, or advisor error in course placement; enhancing students' decision-making capacity; promoting registration equality; and facilitating the opportunity for developmental advising. We found overall positive effects for students in the short- and long-term. As prescriptive building blocks, mandatory prerequisite systems may prompt teachable moments between students and advisors, thus facilitating developmental advising relationships.

Limitations and Future Directions

A few limitations characterize this study. It is based on a single institutional context; however, this research design could be implemented at other universities that either do not yet have automated mandatory prerequisites or where leadership is considering automating a prerequisite checking process. In addition, many composition programs are currently implementing or considering DSP, and our results and methods could be useful as we found that prerequisite systems that rely upon objective measurements have the potential to benefit students.

Additionally, we acknowledge the challenge with using outcome variables such as GPA, which Abou-Sayf (2009) notes is problematic because instructors may compensate for differences in students' abilities, leading to differences in students' GPAs. Abou-Sayf (2009) notes that other "nuisance variables" such as differences in textbooks, course content, and teaching effectiveness may account for differences in GPA as well. Additional limitations include other factors that could have led to the positive outcomes described in this paper; for example, at the same time the registration errors were discovered, the composition program transferred leadership to another faculty member. In following semesters, the new program coordinator instituted more in-depth and comprehensive training for teaching assistants who teach almost one half of the sections of introductory composition. Such factors are difficult to control and may affect the results.

Despite the limitations, this study advances the

idea that automated, mandatory prerequisites systems may benefit institutions and students. Additionally, the long-term benefits may outweigh the short-term costs associated with implementing prerequisite enforcement in a registration system. Most certainly, the process requires that students enroll in necessary developmental course work, which we surmise to be positively related to students' academic success in introductory composition.

We advocate future research that explores other academic factors positively related to automated, mandatory prerequisite systems so that additional benefits may be analyzed. Additional research into the cost-effectiveness of implementing such changes into the existing registration system may also provide institutional stakeholders with an important understanding of the potential return on investment. These benefits could extend beyond immediate student success indicators such as GPA and retention; for example, university faculty no longer burdened with prerequisite enforcement could spend more time on instruction and class activities at the beginning of the semester. Finally, future research that examines the enforcement prerequisites of other disciplines, such as in science and mathematics, may yield important insights into the relationship between prerequisites and academic success in those disciplines.

In Summary

We found that automated prerequisite systems yield the potential to positively impact students. As a prescriptive means of prohibiting students from selecting incorrect courses, prerequisite systems can also facilitate developmental relationships between students who typically self-advise and academic advisors. Therefore, universities that do not already offer mandatory or automated prerequisite systems may benefit from such systems on their campuses.

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Appendix. Advisor Survey

How would you categorize your role as an advisor?
- __ College advisor
- __ Department advisor
- __ Faculty advisor
- __ Enrollment/financial aid advisor
- __ Administrator
- __ Other_____

In general, what is your opinion of how your work changed as a result of the new prerequisite system?

In general, what is your opinion of how things changed for students as a result of the new prerequisite system?

In general, what is your opinion of how university processes have changed as a result of the new prerequisite system?

Please indicate your agreement with the following effects of the prerequisite system on students in regards to registration for introductory composition only (strongly agree to strongly disagree)
- __ students make better decisions when registering for courses
- __ students are prohibited from selecting incorrect courses
- __ prerequisite enforcement prevents students from making inappropriate decisions related to registration
- __ students who do not meet prerequisites are prompted to contact an advisor to learn why they cannot register for a blocked course
- __ students who do not meet prerequisites are prompted to read the catalog/schedule or conduct research to learn why they cannot register for a blocked course
- __ students who do not meet prerequisites are prompted to contact an advisor to learn why they cannot register for a blocked course earlier in the registration process
- __ students are better prepared to learn how to meet prerequisites (e.g. by taking a placement exam or submitted scores)
- __ students are more successful in their composition courses
- __ students are more prepared to be successful in their composition courses
- __ students are placed into the right courses for their writing and reading skills
- __ the prerequisite system increases students' self-advising
- __ the prerequisite system makes students better self-advisors

Please indicate your agreement with the following effects of the prerequisite system on advisors in regards to registration for introductory composition only (strongly agree to strongly disagree):
- __ staff and advisors' jobs are easier overall
- __ staff and advisors' workload is reduced in this area
- __ staff and advisors' workload is increased in this area
- __ staff and advisors are able to assist students with other problems and are not burdened with providing as much prerequisite information
- __ staff and advisors are burdened with providing more prerequisite information
- __ staff and advisors are able to assist more students with composition course registration
- __ the new system reduces staff and advisors' advising errors

Appendix. Advisor Survey (continued)

Please indicate your agreement with the following effects of the prerequisite system on the university in regards to registration for introductory composition only (strongly agree to strongly disagree):

__ the registration process is streamlined for students
__ registration is less chaotic in general
__ registration is less chaotic at the beginning of each term
__ courses fill more quickly
__ courses fill more quickly, prompting students to register earlier each year
__ the "organizational chaos" resulting from the entire registration process is minimized
__ offices are run more smoothly at the beginning of each semester
__ wait times for students to see an advisor are reduced
__ wait times for students to take a placement exam are reduced
__ reduces registration errors

Please indicate your agreement or disagreement with the following statements (strongly disagree to strongly agree):

__ The new prerequisite system positively impacts my work with students.
__ The new prerequisite system positively impacts students overall.
__ The new prerequisite system positively impacts the university overall.
__ First-year students (those who might be more inclined to take introductory composition) generally do a good job self-advising into courses.
__ Students who meet prerequisites for classes such as introductory composition are more likely to be successful in that class than students who do not meet prerequisites.
__ Students who self-advise into courses generally register for the correct courses.

If you agree with the above statement, why do you believe that students who meet prerequisites for courses are more likely to be successful than students who do not meet prerequisites?

__ students are more intellectually capable
__ students are more confident in their skills
__ students are emotionally ready for the challenge
__ other