

Campus-Based Practices for Promoting Student Success: Software Solutions

Research Brief
September 2015

Midwestern
Higher Education
Compact



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About this MHEC Research Brief Series

This research brief is drawn from specific topics examined in the forthcoming MHEC report, *Institutional Practices Conducive to Student Success: An Overview of Theory and Research*.

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Campus-Based Practices for Promoting Student Success: Software Solutions

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Colleges and universities are increasingly adopting various software solutions to raise degree completion rates and lower costs (Ferguson, 2012; Vendituoli, 2014; Yanosky, 2014). Student success software, also known as Integrated Planning and Advising Services (IPAS), appears to be in high demand among both students and faculty (Dahlstrom & Bichsel, 2014; Dahlstrom & Brooks, 2014). For example, in a recent survey of students at 185 postsecondary institutions, over 80% of respondents indicated at least moderate interest in using software for guiding course selection, monitoring and improving performance, and identifying relevant resources (Dahlstrom & Bichsel, 2014).

This brief provides an overview of student success software and summarizes findings from the nascent body of student outcomes research. Student success software can be generally classified as one of three types: academic planning systems, task engagement systems, and early alert systems (see Table 1). Academic planning software can assist students in creating a degree plan and monitoring degree progress. Task engagement software can provide automated behavioral cues, reminders, and positive reinforcement that help students to complete coursework and comply with administrative deadlines. Early warning systems are designed to collect and utilize student data to alert faculty and staff of students in need of assistance. This brief concludes with the identification of several campus practices that may promote the successful implementation of new software solutions.

Table 1. Examples of Software Products for Promoting Student Success

Vendor or Institution	Product
<i>Academic Planning Systems</i>	
Civitas Learning	Degree Map
CollegeSource	u.achieve & u.direct
Desire2Learn	Brightspace Degree Compass
Edunav	Edunav
Hobsons	AgileGrad
Oracle	PeopleSoft Campus Solutions
Redrock	TutorTrac & AdvisorTrac
Starfish Retention Solutions	Starfish ADVISING
Student Success Plan	Student Success Plan
Valencia Community College	LifeMap
Virginia Community College System	Virginia Education Wizard

Table1. Examples of Software Products for Promoting Student Success (continued)

Vendor or Institution	Product
<i>Task Engagement Systems</i>	
Beyond 12	MyCoach
GradGears	GradGuru
Persistence Plus	Persistence Plus
<i>Early Alert Systems</i>	
Blackboard	Blackboard Analytics Suite
Campus Labs	Beacon
Purdue University	Course Signals
Education Advisory Board	Student Success Collaborative
Ellucian	Colleague Retention Alert
Ellucian	Banner Student Retention Performance
EMAS	Retention Pro
Hobsons	Retain
Jenzabar	Jenzabar JX
EBI	Map Works
Pharos	Pharos 360
QuScient	ProRetention
SARS	SARS Anywhere
SmartEvals	DropGuard
Starfish Retention Solutions	Starfish Early Alert

Academic Planning Systems

Academic planning software has been developed to assist students in creating a degree plan and monitoring degree progress. Degree plans specify career objectives and curricular roadmaps; some programs also recommend courses based on degree relevance and the likelihood of success. For instance, Austin Community College incorporated a Civitas Learning program called Degree Map into the advising process, which provided both the student and advisor a visual depiction of the student's current program inclusive of all credits completed toward the degree. Degree Map also showed "comparisons of degree plan options, the impact of switching degree plans, and the identification of additional certifications for which the student may (nearly) be eligible to apply" (Brooks, 2014, p.7). In another example, Degree Compass at Austin Peay State University utilizes predictive analytics with transcript data to make personalized course recommendations that attempt

to match student abilities and program requirements. "From the courses that apply directly to the student's program of study, the system selects those courses that fit best with the sequence of courses in their degree and are the most central to the university curriculum as a whole. That ranking is then overlaid with a model that predicts which courses the student will achieve their best grades" (Whitten, Sanders, & Stewart, 2013, p. 39). Academic planning software should not replace advisors, though, as students prefer a mix of self-service tools and face-to-face interaction with advisors (Yanosky, 2014).

Heretofore, evaluations of academic planning systems have only been descriptive in nature (Herndon, 2011; Shugart & Romano, 2008; Whitten, Sanders, & Stewart, 2013). In his examination of the Virginia Education Wizard, a statewide online portal for career and college planning, Herndon (2011) reported that 29% of Wizard users at community colleges had received financial aid, compared to 26% of non-users. In addition, 46% of Wizard users earned a GPA of 3.0 or higher, compared to 38% of non-users. However, this study did not control for pre-existing characteristics of users and non-users.

Task Engagement Software

Task engagement software provides automated behavioral cues, reminders, and positive reinforcement that help students to complete coursework and comply with administrative deadlines (e.g., financial aid). Several task engagement software applications have been designed for mobile phones, though only Persistence Plus has been the focus of research. Persistence Plus uses demographic and behavioral data to send daily "nudges" to students that are intended to promote task completion, motivation, and resource utilization (Carmean & Frankfort, 2013). For example, students may receive a task completion nudge before an exam – "Several people have tests coming up! Where are you going to study this weekend?" – which is followed by a blank text box and a submit button for the student to respond. Persistence Plus also provides students with "LifeBits," which are narrative accounts of students with similar backgrounds (e.g., ethnicity, gender, first-generation) who have successfully overcome obstacles and completed college.

Two studies of Persistence Plus have been conducted with simple comparisons of participants and non-participants. The University of Washington Tacoma (UWT) used Persistence Plus in two online courses, mathematics and economics. An evaluation of student outcomes revealed that course

completion rates were 12 percentage points higher among Persistence Plus students in math and 19 percentage points higher among Persistence Plus students in economics, relative to students who did not use the software (Carmean & Frankfort, 2013). Another study was conducted at Middlesex Community College, where Maslin, Frankfort, and Jaques-Leslie (2014) found that the fall to spring retention rate was seven percentage points higher among 300 Persistence Plus students, relative to the retention rate of non-participants. Additional research is needed to determine whether these differences can be attributed to task engagement software.

Early Warning Systems

Early warning systems are designed to collect and utilize student data to alert faculty and staff of students in need of assistance (Bruce et al., 2011). Over 90% of four-year institutions and 70% of community colleges have adopted some type of early warning system (Barefoot, Griffin, & Koch, 2012; College Board, 2012). Although the general goal of early warning systems is universal, systems differ in their ability to monitor the effects of student interventions and link with commercial student surveys, learning management systems, and student information systems (Hanover Research, 2013). Moreover, whereas some early warning systems rely on faculty to identify students who are struggling with coursework, other systems use predictive analytics to automatically flag at-risk students (MacFayden & Dawson, 2010). Table 2 summarizes other prominent variations in how these systems are used at four-year institutions. For example, whereas over half of institutions targeted all sophomore students, only 35% of institutions used early warning systems for all first-year students. Absenteeism was the most common indicator used to trigger a warning; indicators of academic effort and grades below a “C” were less common. Interestingly, 30% of institutions did not monitor students continuously, and only 39% of institutions required students to obtain assistance when flagged.

Despite the widespread adoption of early warning systems, few studies on system effectiveness have been published. In fact, in their national survey of four-year institutions, Barefoot, Griffin, and Koch (2012) found that 28% of institutions had not evaluated the effectiveness of their early alert systems. Less than half of campuses surveyed detected positive effects: only 40% reported improvements in persistence or graduation rates, and only 36% reported improvements in academic performance (Barefoot et al., 2012).

Particular institutional evaluations suggest that early warning systems are perceived as useful and may be associated with student success (Arnold & Pistilli, 2012; Campbell, DeBlois, & Oblinger, 2007; Faulconer et al., 2014; Picciano, 2012). Faulconer et al. (2014) examined the implementation of the Starfish Retention system at East Carolina University and found that over 90% of students who had received a kudos flag reported that it was motivational; and 85% of students who had received an academic warning reported taking some action. Rio Salado Community College determined that their early warning system had assisted staff in identifying the challenges that students faced, adding necessary context to conversations about institutional improvement (Picciano, 2012). Finally, at Sinclair Community College, new students who had completed an individual learning plan that provided alerts to advisors had a retention rate of 93%, compared to a retention rate of 65% among non-participants (Campbell, DeBlois, & Oblinger, 2007). However, it remains unclear whether these differences are attributable to the adoption of an early warning system.

Table 2. Characteristics of Early Warning Systems at Four-Year Institutions.

Characteristics	Percent of Institutions
<i>Targeted Students</i>	
All first-year students	35
Some first-year students (e.g., student athletes)	27
All sophomores	58
Some sophomores (e.g., on academic probation)	27
All transfer students	56
Some transfer students	21
<i>Behaviors that Trigger Warning</i>	
Absenteeism	90
Failing grades	84
Behavioral problems	71
Grades below a "C"	65
Low participation or effort	60
<i>Contact Features</i>	
Students are contacted	91
Students are informed about how to seek assistance	85
Students are monitored continuously	70
Students are contacted face-to-face	61

Table 2. Characteristics of Early Warning Systems at Four-Year Institutions (continued)

Characteristics	Percent of Institutions
<i>Contact Features (continued)</i>	
Students are required to obtain assistance	39
Students' families are notified after a waiver of privacy rights	17
<i>Staff Involvement</i>	
Academic advisors	89
Faculty	89
Academic support personnel	83
Athletic department staff	74
Counseling staff	53
Residence hall staff	52

Source. Barefoot, B. O., Griffin, B. Q., & Koch, A. K. (2012). *Enhancing student success and retention throughout undergraduate education*.

Successful Implementation

A recent set of case studies identified several practices that characterize successful implementation of new student success software (Karp & Fletcher, 2015; see also Brooks, 2014). First, successful project teams fulfilled three types of roles: content masters, influencers, and decision makers. *Content masters* such as IT staff and advisors provide the necessary technical knowledge; *influencers* are trusted faculty and administrators who develop support for the project, particularly by ensuring that members of the campus community understand the benefits of product adoption; and *decision makers* are those who “have authority to move the project forward or who can cast a vote for a constituency of the community” (Karp & Fletcher, 2015, p. 6). Trust in the project team was cultivated by maintaining openness and transparency at all stages. Moreover, Brooks (2014) emphasized the importance of building campus buy-in through the support of senior leadership – including the president, vice president, and provost – as well as the college business office, faculty, staff, and students.

Second, although new software should add value to student and staff activities, product adoption may inadvertently result in the loss of prior system capabilities and frustrate end-users. Successful implementation was thus facilitated by testing product options to confirm the presence of desired improvements. A pilot test may also help identify needs for training or resources, such as templates

for writing emails when contacting flagged students (Arnold & Pistilli, 2012).

Third, in addition to meeting the technical requirements of a particular software product, successful colleges considered whether product adoption would require any changes in institutional policies and procedures. Degree planning software, for instance, may require the specification of program requirements, course schedules, and course transfer protocols. Implementation may be delayed or disrupted if product integration challenges are not addressed upfront.

Fourth, software implementation is rarely a smooth process absent any technical glitches. Although campus IT staff can address some integration issues, other problems may require direct support from the vendor. However, software vendors in the implementation study differed greatly in their technical support services. Some vendors were unresponsive to support requests, whereas others provided representatives who joined project teams and attended meetings.

Finally, successful colleges anticipated and managed the hidden costs of post-launch implementation. For example, end-users in the implementation study “needed time post-rollout to experiment with the system, report problems, and figure out how best to leverage the tool” (Karp & Fletcher, 2015, p. 8). Time should also be allocated to evaluate the impact of software adoption on program goals (Brooks, 2014). A Total Cost of Ownership analysis will certainly reveal other hidden costs of software adoption (e.g., additional personnel, facilities, system upgrades), which are thought to be five to ten times greater than the software purchase price over the course of five years (Schmidt, 2015).

Recommended Practices

Software products are widely perceived as vital to strategies for increasing student success rates (Yanosky, 2014), but contentions about their actual impact on degree completion or academic achievement have not yet undergone rigorous scientific study. Nonetheless, the favorable results of descriptive studies suggest that further experimentation with student success software is warranted.

- The impact of any particular software product will partly depend upon whether software adoption advances the college’s student success strategy. Colleges should conduct a needs assessment to identify software products that address actual problems in academic planning, task engagement, and feedback.
- Project team members should fulfill three types of roles: content masters, influencers, and decision makers.

- Promote campus buy-in through the support and participation of senior leadership, stakeholders, and possible end-users, such as the president, vice president, provost, chief information officer, director of institutional research, the college business office, faculty, staff, and students.
- Cultivate trust in the project team by maintaining openness and transparency at all stages.
- Pilot test product options to confirm the presence of desired improvements and identify needs for training and resources.
- Consider whether product adoption will require any changes in institutional policies and procedures. Address product integration problems before implementation.
- Ensure that software vendors are willing to provide the level of technical support needed.
- Budget time and resources for the total cost of software adoption, including post-launch implementation, product refinement, and outcomes evaluation. A Total Cost of Ownership analysis should be conducted to identify the hidden costs of software adoption (e.g., personnel, facilities, system upgrades).

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